Cristie Automated Disaster Recovery

User Guide

Product Version: 6.3

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Cristie Automated Disaster Recovery

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1 Introduction

This document describes how to configure and run automated disaster recoveries in conjunction with one of the Cristie range of bare metal disaster recovery products such as CBMR or TBMR.

The steps required to prepare for automated DR are as follows:

1. Install the TBMR product.
2. Create the system configuration.
3. Create a system backup.
4. Create an automated DR answer file.
5. Optionally inject the answer file into the DR recovery environment or copy to a Windows compatible removable device (e.g. USB disk).

The steps required to run an automated DR are:

1. If the answer file is located on a removable device make sure its connected to the recovery machine.
2. Boot the customised DR recovery environment.

That's it!

2 Preparation

To enable successful automated DR the following steps should be followed.

2.1 Install Product

Run a normal installation of the Cristie TBMR product. Refer to the separate Product Installation and Licensing Guide for instructions on how to do this.

The Cristie Answer File Creator program will be installed along with the main product.

2.2 Create System Configuration

With TBMR a system configuration will be captured to the system during the installation. If for some reason this hasn't happened either manually run the supplied TBMRCfg.exe program or ensure the TSM BA Client backup is configured to create the configuration as part of a Pre-Sched operation.

Refer to the separate TBMR User Guide for WinPE Based Recovery for further details on this.

2.3 Create System Backup

Use the TSM BA Client to create a full backup as described in the separate TBMR User Guide for WinPE Based Recovery document.

2.4 Create Answer File For Automated DR

During a interactive DR session a User would normally specify recovery parameters. This would include:

- setup network details (DHCP/static IP, gateway IP etc.)
- network details of the TSM server (hostname/IP address, port no.)
- automatic/manual recovery

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- define disk partition layout for recovery
- select partitions to recover
- commence SystemState/file restore
- view/copy log files
- re-boot after DR

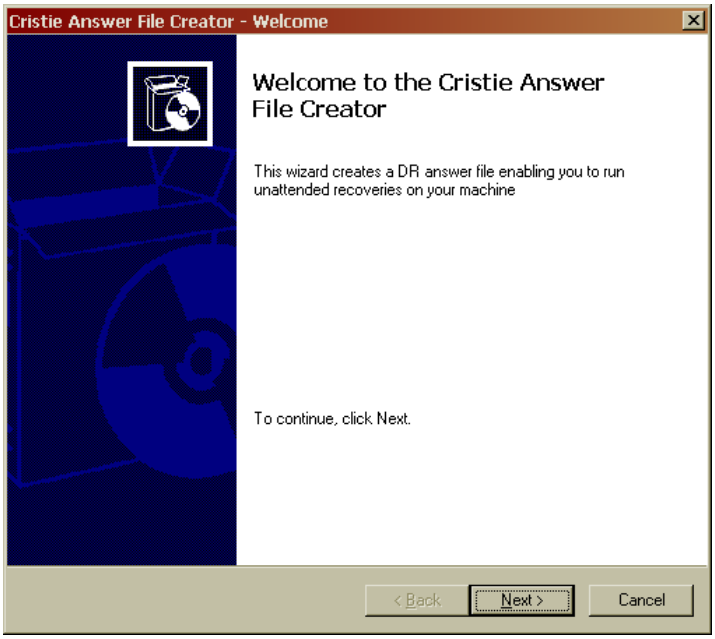
During an unattended DR this same information must be prepared in advance, captured to an answer file and made available to the DR environment as part of the DR start-up process.

Cristie supply an Answer File Creator tool with their BMR products to help you create the answer file. The format of the file is the form of a structured INI file and may be edited by any Windows editor such as Notepad or Wordpad. However it is strongly recommended that the AFC tool is used to initially create the answer file.

2.4.1 Running the Cristie Answer File CreatorTool

Run the AFC tool from the Windows Start menu:

This will invoke the AFC Welcome dialog.


Cristie Answer File Creator - Welcome
Welcome to the Cristie Answer File Creator
This wizard creates a DR answer file enabling you to run unattended recoveries on your machine
To continue, click Next.
< Back
Next >
Cancel

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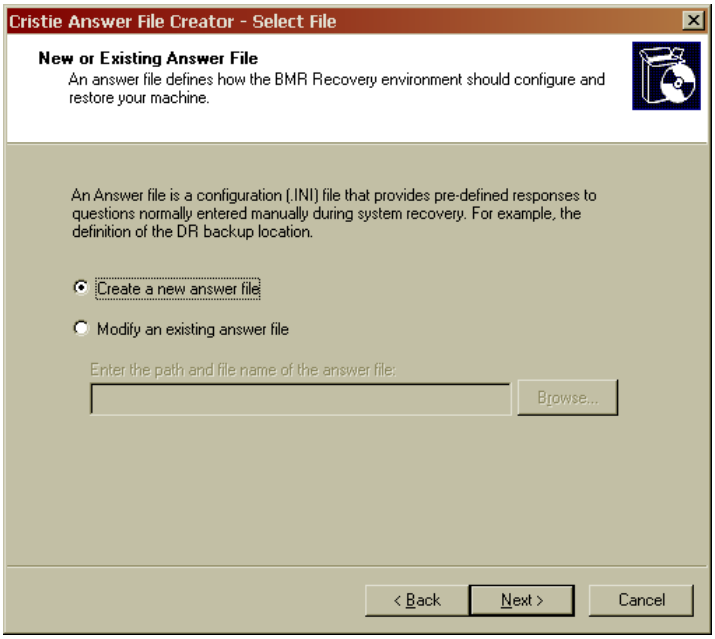
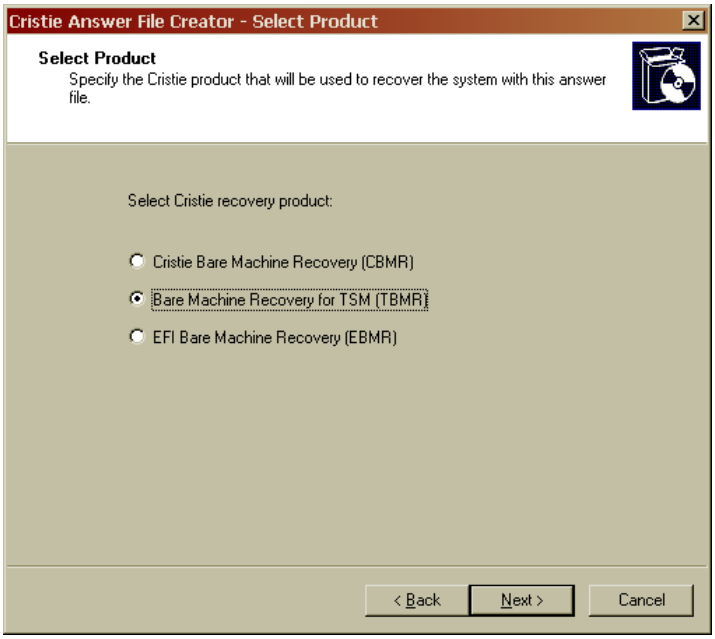
Select **Next>** to continue the next dialog where you can choose to modify an existing dialog or create a new one.


Cristie Answer File Creator - Select File
New or Existing Answer File
An answer file defines how the BMR Recovery environment should configure and restore your machine.
An Answer file is a configuration (.INI) file that provides pre-defined responses to questions normally entered manually during system recovery. For example, the definition of the DR backup location.
Create a new answer file
Modify an existing answer file
Enter the path and file name of the answer file:
Browse...
< Back
Next >
Cancel

Select *Create a new answer file* and click the **Next>** button to choose the Cristie BMR product the answer file is being created for. Note you may use the **Next>** and **Back>** buttons at any time to change information you have already entered before creating the answer file. Select **Cancel** at any time to abandon the answer file creation process and exit the program.

Choose the TBMR product and select **Next>**.


Cristie Answer File Creator - Select Product
Select Product
Specify the Cristie product that will be used to recover the system with this answer file.
Select Cristie recovery product:
Cristie Bare Machine Recovery (CBMR)
Bare Machine Recovery for TSM (TBMR)
EFI Bare Machine Recovery (EBMR)
< Back
Next >
Cancel

TBMR has the capability of restoring from either TSM Nodes or from TSM backupsets.

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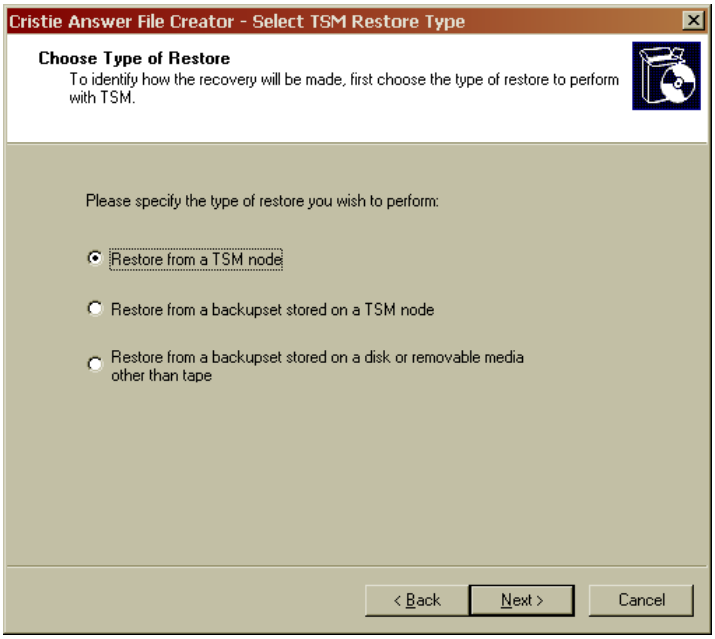
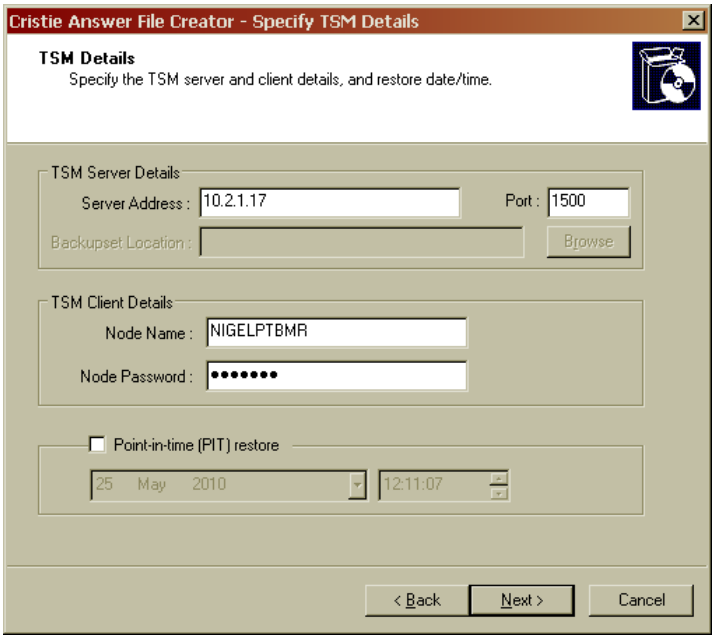
2.4.1.1 Restore From A TSM Node

Select *Restore from a TSM node* and press **Next>**.


Cristie Answer File Creator - Select TSM Restore Type
Choose Type of Restore
To identify how the recovery will be made, first choose the type of restore to perform with TSM.
Please specify the type of restore you wish to perform:
Restore from a TSM node
Restore from a backupset stored on a TSM node
Restore from a backupset stored on a disk or removable media other than tape
< Back
Next >
Cancel

Now specify the *TSM Server and Client* details.



It may be that you want to restore the system to a specific *Point-in-Time* (PIT). If this is the case select the restore date and time by ticking the PIT tick box. This will open up the date/time dialog:

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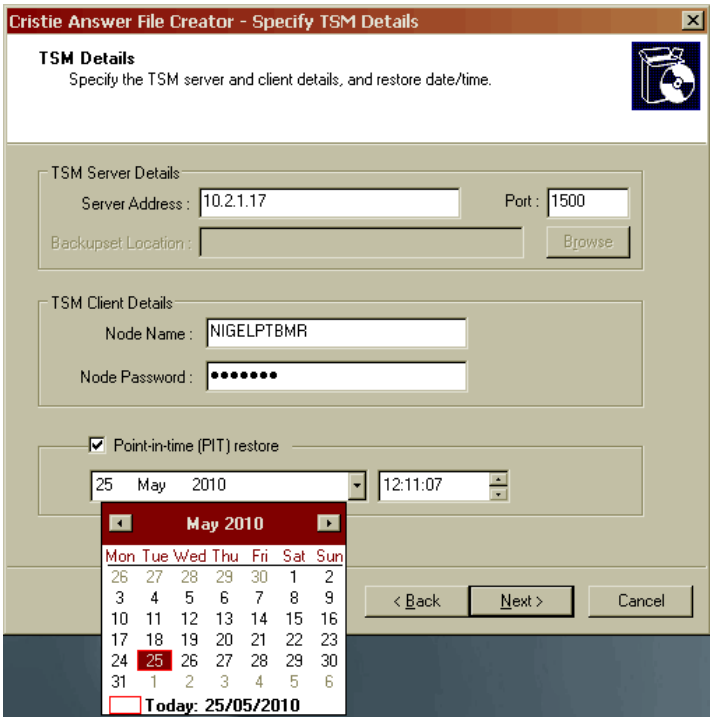
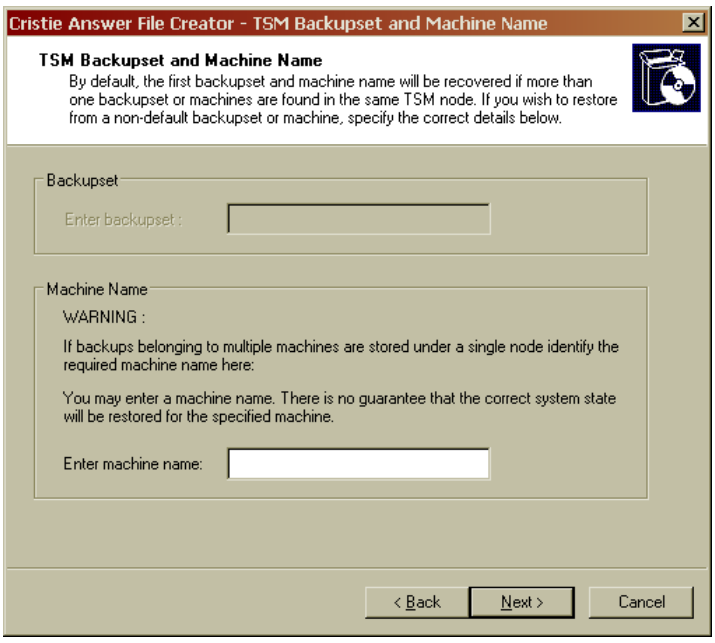

Cristie Answer File Creator - Specify TSM Details
TSM Details
Specify the TSM server and client details, and restore date/time.
TSM Server Details
Server Address : 10.2.1.17
Port : 1500
Backupset Location :
Browse
TSM Client Details
Node Name : NIGELPTBMR
Node Password : •••••••
Point-in-time (PIT) restore
25 May 2010
12:11:07
May 2010
Mon Tue Wed Thu Fri Sat Sun
26 27 28 29 30 1 2
3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31 1 2 3 4 5 6
Today: 25/05/2010
< Back
Next >
Cancel

If the selected TSM Node contains backups for more than 1 system then select the system hostname to be restored in the next dialog. Note neither IBM nor Cristie recommend this practice.


Cristie Answer File Creator - TSM Backupset and Machine Name
TSM Backupset and Machine Name
By default, the first backupset and machine name will be recovered if more than one backupset or machines are found in the same TSM node. If you wish to restore from a non-default backupset or machine, specify the correct details below.
Backupset
Enter backupset :
Machine Name
WARNING :
If backups belonging to multiple machines are stored under a single node identify the required machine name here:
You may enter a machine name. There is no guarantee that the correct system state will be restored for the specified machine.
Enter machine name:
< Back
Next >
Cancel

Press **Next>** to continue to the *Specify Restore Options* dialog. Here you may specify whether just the default system drive (partition or volume) will be restored, or *All Drives*. Also you may specify where you want the restore logfiles to be copied at the end of DR process. You may also identify the level of detail in the log files.

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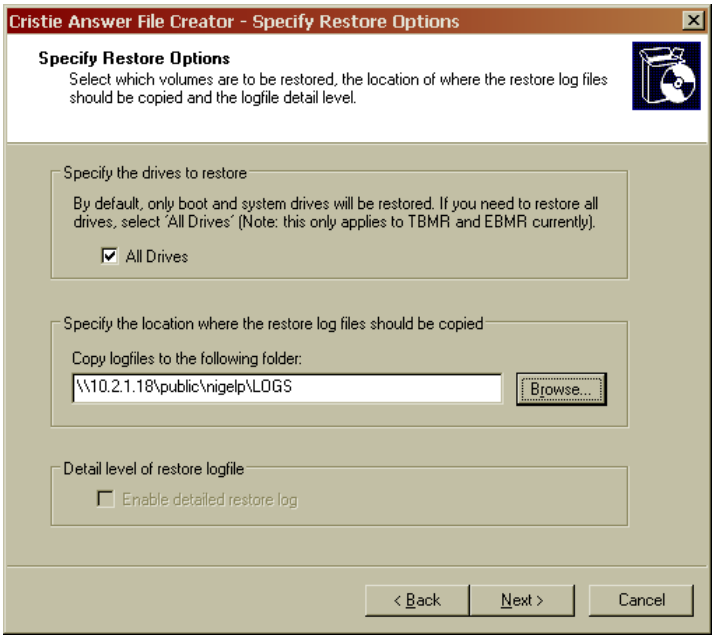
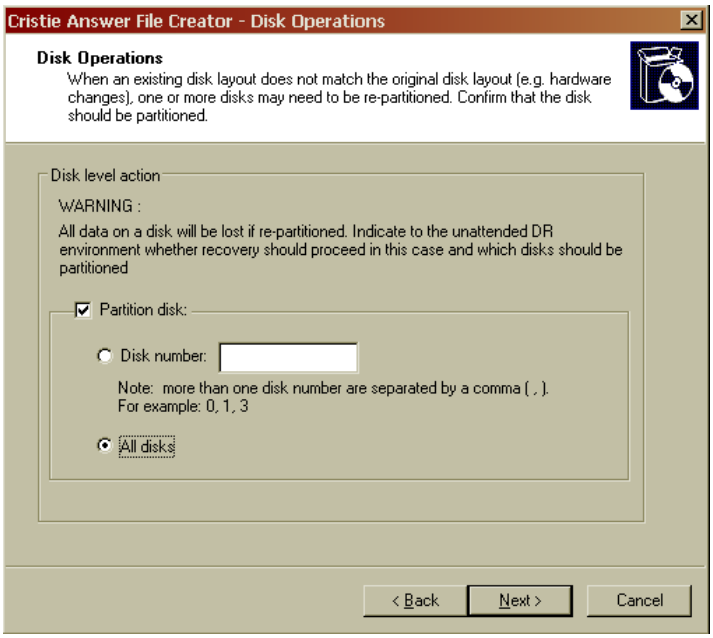

Cristie Answer File Creator - Specify Restore Options
Specify Restore Options
Select which volumes are to be restored, the location of where the restore log files should be copied and the logfile detail level.
Specify the drives to restore
By default, only boot and system drives will be restored. If you need to restore all drives, select 'All Drives' (Note: this only applies to TBMR and EBMR currently).
All Drives
Specify the location where the restore log files should be copied
Copy logfiles to the following folder:
\\10.2.1.18\public\nigelp\LOGS
Browse...
Detail level of restore logfile
Enable detailed restore log
< Back
Next >
Cancel

Press **Next>** to continue to the *Disk Operations* dialog. Here select the individual disks to be formatted on restore or *All disks* if all disks should be formatted. Identify individual disks as *0, 1, 2 …* etc.


Cristie Answer File Creator - Disk Operations
Disk Operations
When an existing disk layout does not match the original disk layout (e.g. hardware changes), one or more disks may need to be re-partitioned. Confirm that the disk should be partitioned.
Disk level action
WARNING :
All data on a disk will be lost if re-partitioned. Indicate to the unattended DR environment whether recovery should proceed in this case and which disks should be partitioned
Partition disk:
Disk number:
Note: more than one disk number are separated by a comma (,).
For example: 0, 1, 3
All disks
< Back
Next >
Cancel

If the DR is to dissimilar hardware (i.e. not the original system) then the recovered system may require new drivers to support different mass storage or network controllers. These new drivers are supplied by the customer and must be accessible to the *Dissimilar Hardware Wizard* (DHW) during the recovery process. Specify the location of a folder (or folders) where the DHW will retrieve these drivers from. For example, this could be a locally attached device like a USB disk or a network share or both.

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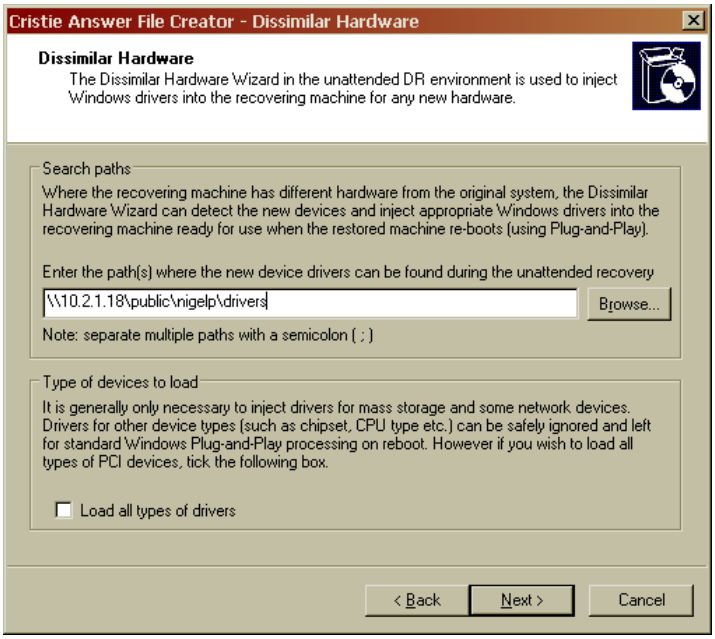
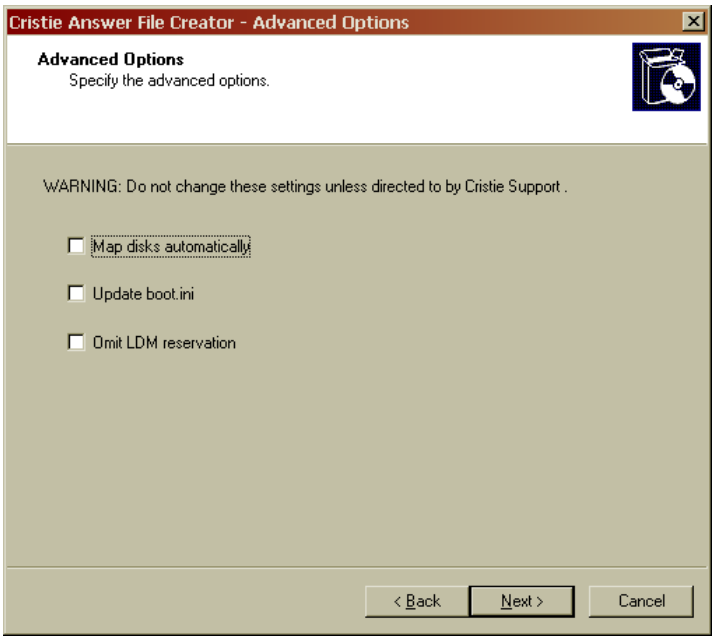

Cristie Answer File Creator - Dissimilar Hardware
Dissimilar Hardware
The Dissimilar Hardware Wizard in the unattended DR environment is used to inject Windows drivers into the recovering machine for any new hardware.
Search paths
Where the recovering machine has different hardware from the original system, the Dissimilar Hardware Wizard can detect the new devices and inject appropriate Windows drivers into the recovering machine ready for use when the restored machine re-boots (using Plug-and-Play).
Enter the path(s) where the new device drivers can be found during the unattended recovery
\\10.2.1.18\public\nigelp\drivers
Browse...
Note: separate multiple paths with a semicolon (;)
Type of devices to load
It is generally only necessary to inject drivers for mass storage and some network devices. Drivers for other device types (such as chipset, CPU type etc.) can be safely ignored and left for standard Windows Plug-and-Play processing on reboot. However if you wish to load all types of PCI devices, tick the following box.
Load all types of drivers
< Back
Next >
Cancel

Normally only mass storage and network controllers need to be considered. However, if all driver classes need to be examined select the *Load all types of drivers* tick box. Select **Next>** to continue to the *Advanced Options* dialog.


Cristie Answer File Creator - Advanced Options
Advanced Options
Specify the advanced options.
WARNING: Do not change these settings unless directed to by Cristie Support .
Map disks automatically
Update boot.ini
Omit LDM reservation
< Back
Next >
Cancel

Unless Cristie Support direct you to change these settings leave them at their default settings. Press **Next>** to continue to the Network Connection dialog. Here you can define a list of network connection credentials that will be used by automated DR to access any network shares identified in earlier dialogs (e.g. copy log files, DHW drivers etc.).

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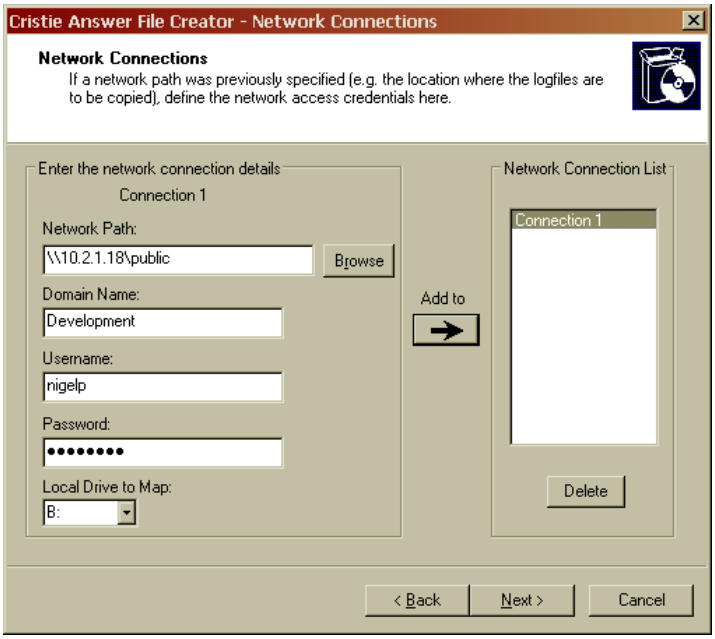
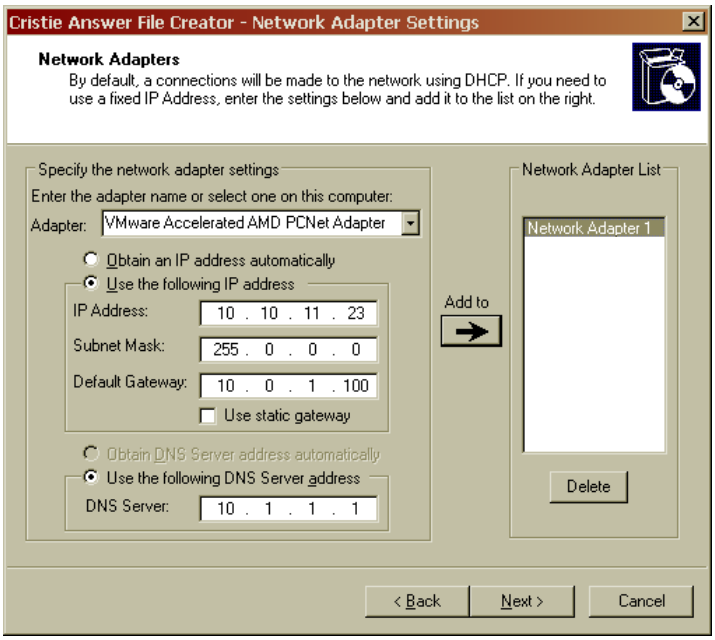


Press the **Add to->** button to add a new definition to the Connection list. Use the **Delete** button to remove an existing Connection definition. Press **Next>** to continue to the *Network Adapter* dialog.


Cristie Answer File Creator - Network Adapter Settings
Network Adapters
By default, a connections will be made to the network using DHCP. If you need to use a fixed IP Address, enter the settings below and add it to the list on the right.
Specify the network adapter settings
Enter the adapter name or select one on this computer:
Adapter:
VMware Accelerated AMD PCNet Adapter
Obtain an IP address automatically
Use the following IP address
IP Address:
10 . 10 . 11 . 23
Subnet Mask:
255 . 0 . 0 . 0
Default Gateway:
10 . 0 . 1 . 100
Use static gateway
Obtain DNS Server address automatically
Use the following DNS Server address
DNS Server:
10 . 1 . 1 . 1
Add to
Network Adapter List
Network Adapter 1
Delete
< Back
Next >
Cancel

Here you can specify how the default network settings should be setup in the PE DR environment at boot time. These settings apply to the recovery environment only - not the restored machine. Create a new Adapter name and associated network settings or use an existing network adapter and settings captured from the current host.

Press the **Add to->** button to add a new definition to the Adapter list. Use the **Delete** button to remove an existing Adapter definition. Press **Next>** to continue to the *Reboot Options* dialog.

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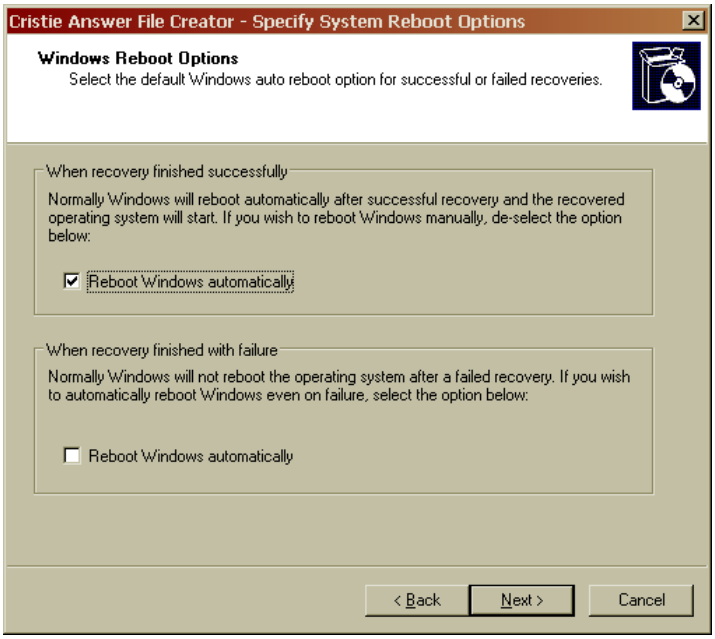
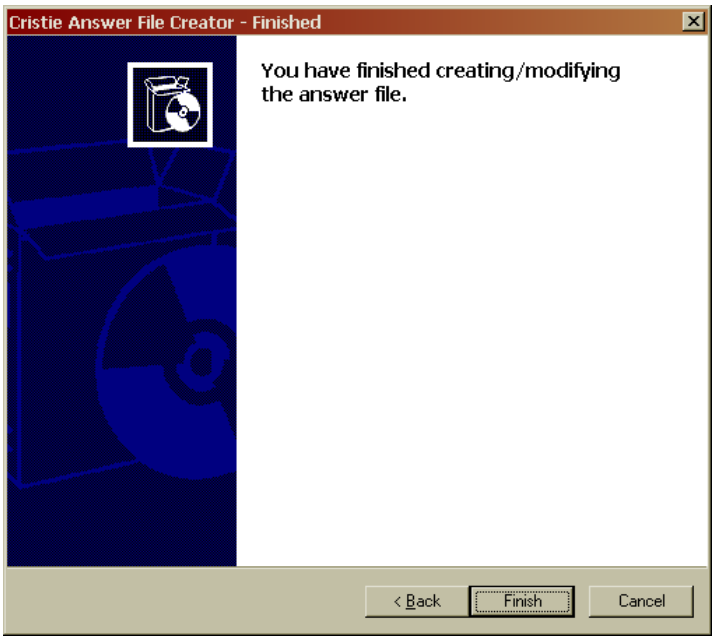

Cristie Answer File Creator - Specify System Reboot Options
Windows Reboot Options
Select the default Windows auto reboot option for successful or failed recoveries.
When recovery finished successfully
Normally Windows will reboot automatically after successful recovery and the recovered operating system will start. If you wish to reboot Windows manually, de-select the option below:
Reboot Windows automatically
When recovery finished with failure
Normally Windows will not reboot the operating system after a failed recovery. If you wish to automatically reboot Windows even on failure, select the option below:
Reboot Windows automatically
< Back
Next >
Cancel

Specify how the automated DR should handle the post recovery re-boot when the DR finishes with success or failure. If the DR is successful select the automatic re-boot option. If the DR fails it is unlikely that the re-boot will succeed so there is little point in proceeding with the re-boot. However if a re-boot should be attempted, even in a failure scenario, tick the failure auto re-boot option.

This is the last step in the answer file definition confirmed with the following dialog:



Select **Finish** to generate the answer file. A pop-up will be displayed prompting for the name and location of where the AFC should create the answer file.

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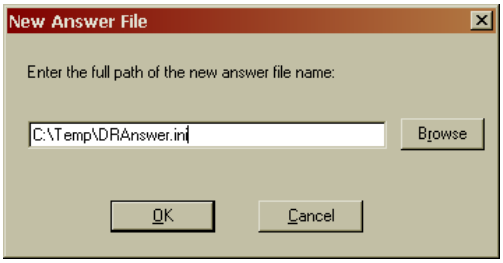

Select a path and press **OK**. This will create a file called `AnswerFile.ini` in the `C:\Temp` folder. The contents of a typical answer file is shown below for reference.

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```
[ProductType]

Product = "TBMR"

[TbmrBackupLocation]

StorageType = "Normal"
ServerName = "10.2.1.17"
ServerPort = 1500
NodeName = "NIGELPTBMR"
NodePassword = "Encrypted: 828211cf2ac6b2"

[RestoreData]

Drives = "All"

[LogFiles]

RestoreLogDetailed = "No"
LogfileCopyPath = "\\10.2.1.18\public\nigelp\LOGS"

[NetLogin]

Connection1 = "params.Connection1"

[params.Connection1]

NetworkPath = "\\10.2.1.18\public"
Domain = "Development"
Username = "nigelp"
Password = "Encrypted: 95860a8f6b9fbe1f"
MapToDrive = "B:"

[NetAdapters]

Adapter1 = "params.Adapter1"

[params.Adapter1]

AdapterName = "VMware Accelerated AMD PCNet Adapter"
IPAddress = "10.10.11.23"
SubnetMask = "255.0.0.0"
Gateway = "10.0.1.100"
DnsServer = "10.1.1.1"

[System]

RebootOnSuccess = "True"
RebootOnFailure = "False"

[DiskOperation]

PartitionDisk = "All"

[DissimilarHardware]

DriverPaths = "\\10.2.1.18\public\nigelp\drivers"
```

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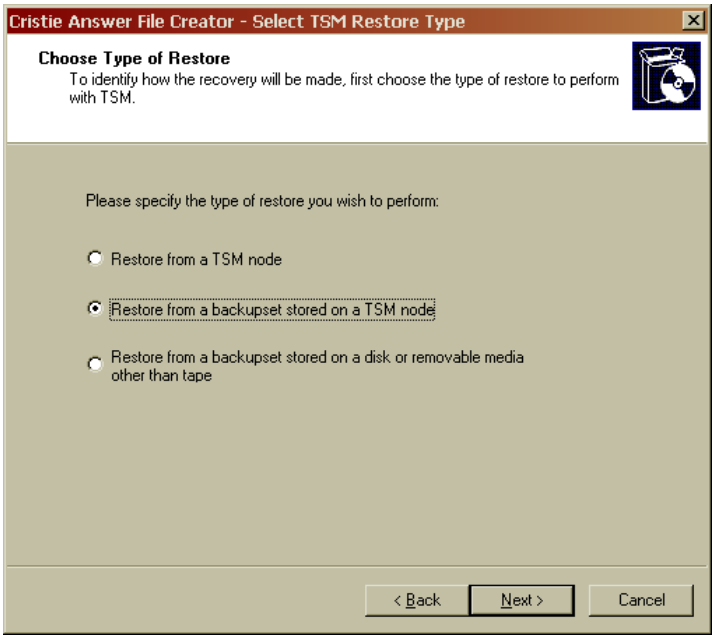
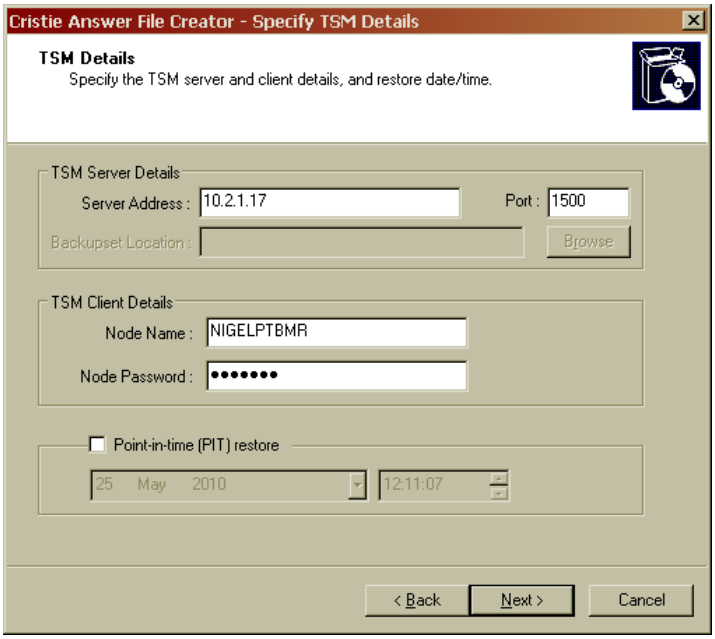
2.4.1.2 Restore From A BackupSet Stored On A TSM Node

Select *Restore from a backupset stored on a TSM node* and press **Next>**.


Cristie Answer File Creator - Select TSM Restore Type
Choose Type of Restore
To identify how the recovery will be made, first choose the type of restore to perform with TSM.
Please specify the type of restore you wish to perform:
Restore from a TSM node
Restore from a backupset stored on a TSM node
Restore from a backupset stored on a disk or removable media other than tape
< Back
Next >
Cancel

Now specify the *TSM Server and Client* details.



It may be that you want to restore the system to a specific *Point-in-Time* (PIT). If this is the case select the restore date and time by ticking the PIT tick box. This will open up the date/time dialog:

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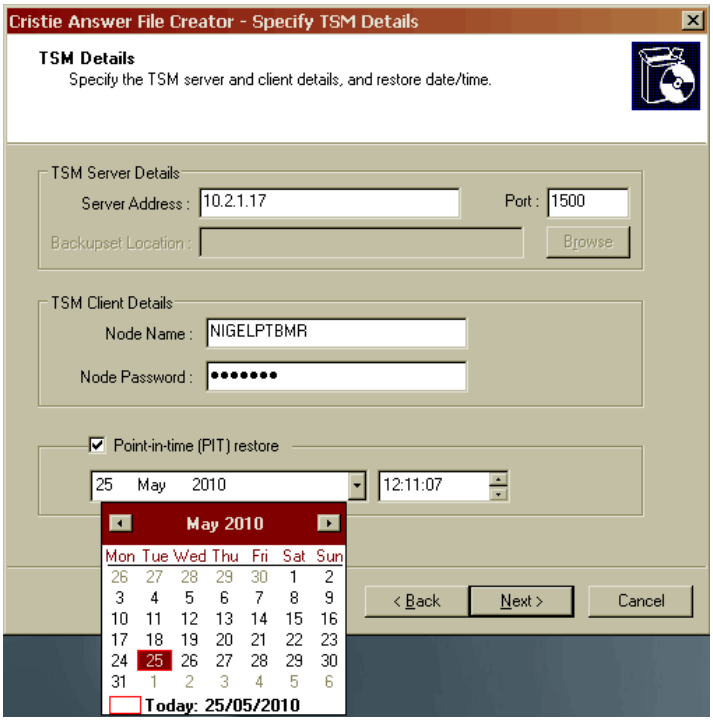
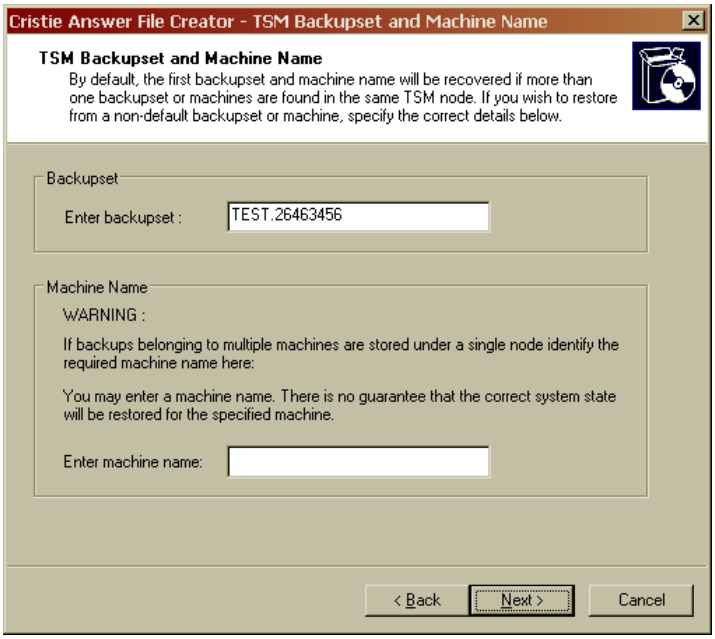

Cristie Answer File Creator - Specify TSM Details
TSM Details
Specify the TSM server and client details, and restore date/time.
TSM Server Details
Server Address : 10.2.1.17
Port : 1500
Backupset Location :
Browse
TSM Client Details
Node Name : NIGELPTBMR
Node Password : •••••••
Point-in-time (PIT) restore
25 May 2010
12:11:07
May 2010
Mon Tue Wed Thu Fri Sat Sun
26 27 28 29 30 1 2
3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31 1 2 3 4 5 6
Today: 25/05/2010
< Back
Next >
Cancel

Select **Next>** to display the TSM Backupset and Machine Name dialog.


Cristie Answer File Creator - TSM Backupset and Machine Name
TSM Backupset and Machine Name
By default, the first backupset and machine name will be recovered if more than one backupset or machines are found in the same TSM node. If you wish to restore from a non-default backupset or machine, specify the correct details below.
Backupset
Enter backupset : TEST.26463456
Machine Name
WARNING :
If backups belonging to multiple machines are stored under a single node identify the required machine name here:
You may enter a machine name. There is no guarantee that the correct system state will be restored for the specified machine.
Enter machine name:
< Back
Next >
Cancel

Enter the name of the backupset. This name consists of 2 parts - a prefix specified when the backupset is first created, and an ID auto generated by TSM. So for example a typical name would be *TEST.26463456* where *TEST* is supplied by the User and the ID *26463456* is supplied by TSM. The full name is returned by TSM to the BA Client after creating the backupset so please make a note of it. Alternatively query the Node in the TSM database to get the full name (e.g. *QUERY BACKUPSET NIGELPTBMR* which will list all the backupsets for the Node *NIGELPTBMR*).

If the selected TSM Node contains backups for more than 1 system then also select the system hostname to be restored in the next dialog. Note neither IBM nor Cristie recommend this practice.

Press **Next>** to continue to the *Specify Restore Options* dialog. Here you may specify whether just the default system drive (partition or volume) will be restored, or *All Drives*. Also you may specify

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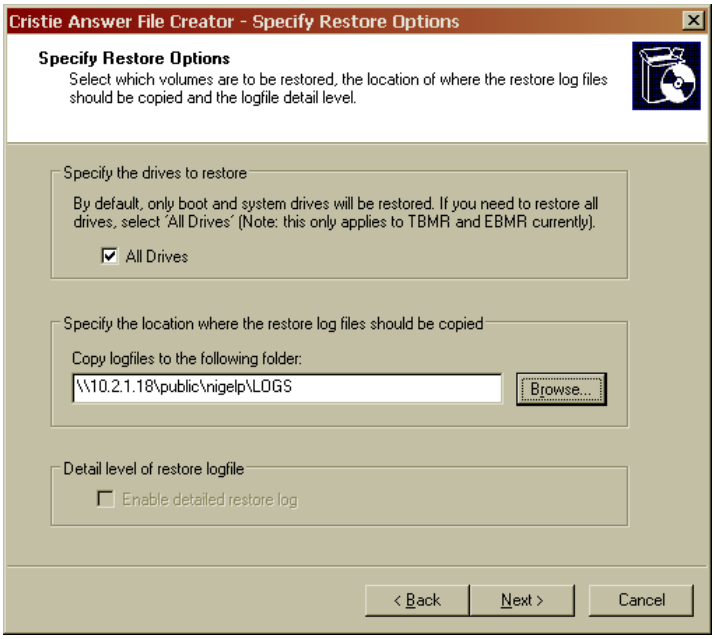
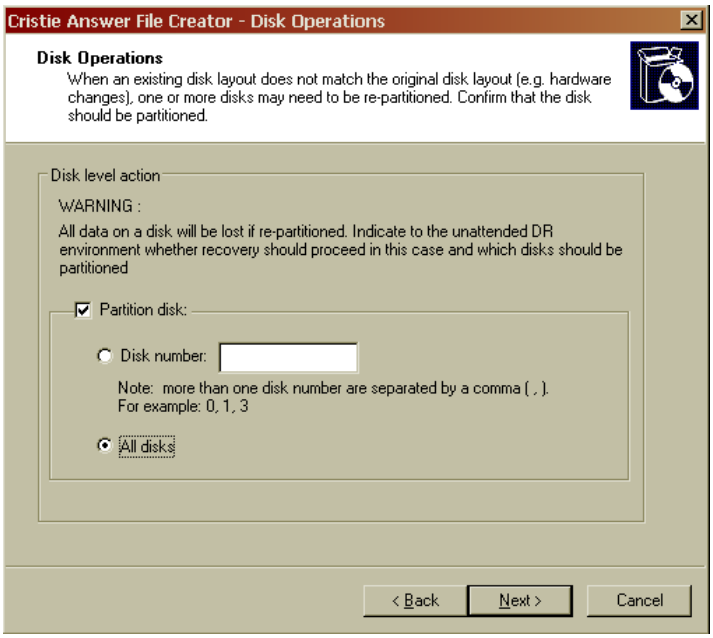
where you want the restore log files to be copied at the end of DR process. You may also identify the level of detail in the log files.


Cristie Answer File Creator - Specify Restore Options
Specify Restore Options
Select which volumes are to be restored, the location of where the restore log files should be copied and the logfile detail level.
Specify the drives to restore
By default, only boot and system drives will be restored. If you need to restore all drives, select 'All Drives' (Note: this only applies to TBMR and EBMR currently).
All Drives
Specify the location where the restore log files should be copied
Copy logfiles to the following folder:
\\10.2.1.18\public\nigelp\LOGS
Browse...
Detail level of restore logfile
Enable detailed restore log
< Back
Next >
Cancel

Press **Next>** to continue to the *Disk Operations* dialog. Here select the individual disks to be formatted on restore or *All disks* if all disks should be formatted. Identify individual disks as *0, 1, 2 ...* etc.


Cristie Answer File Creator - Disk Operations
Disk Operations
When an existing disk layout does not match the original disk layout (e.g. hardware changes), one or more disks may need to be re-partitioned. Confirm that the disk should be partitioned.
Disk level action
WARNING :
All data on a disk will be lost if re-partitioned. Indicate to the unattended DR environment whether recovery should proceed in this case and which disks should be partitioned
Partition disk:
Disk number:
Note: more than one disk number are separated by a comma (,).
For example: 0, 1, 3
All disks
< Back
Next >
Cancel

If the DR is to dissimilar hardware (i.e. not the original system) then the recovered system may require new drivers to support different mass storage or network controllers. These new drivers are supplied by the customer and must be accessible to the *Dissimilar Hardware Wizard* (DHW) during the recovery process. Specify the location of a folder (or folders) where the DHW will retrieve these drivers from. For example, this could be a locally attached device like a USB disk or a network share or both.

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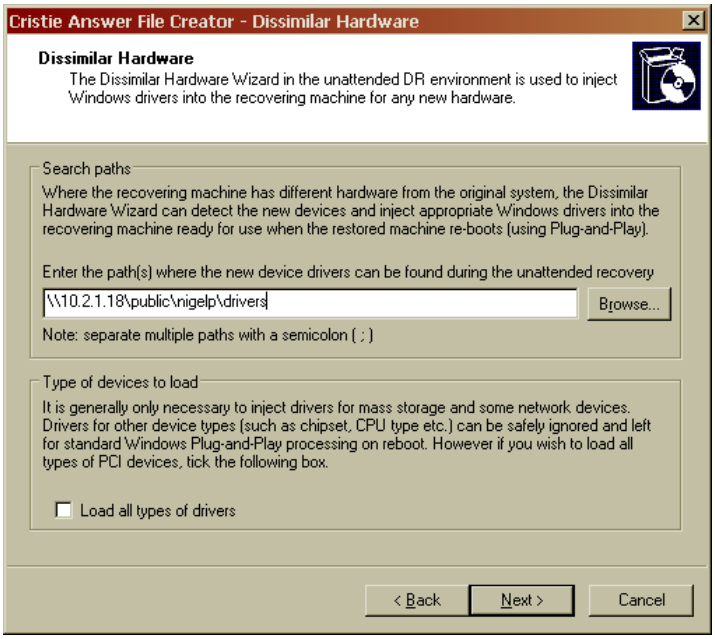
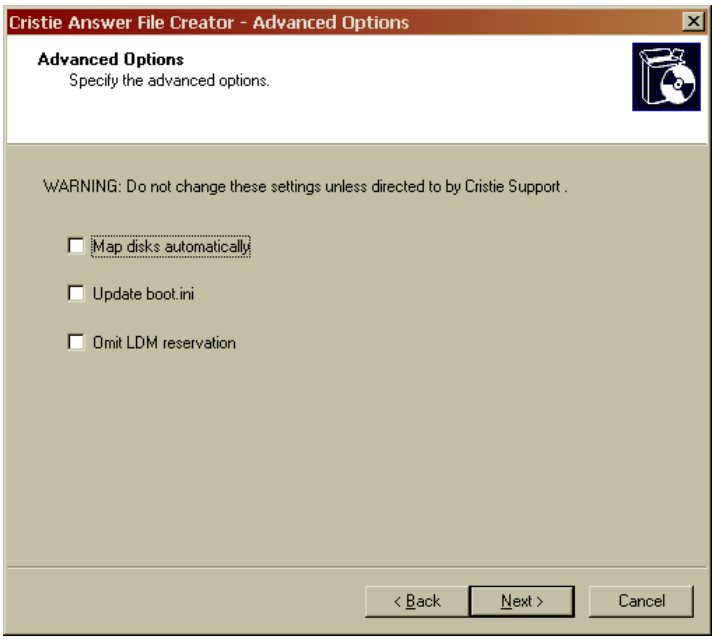

Cristie Answer File Creator - Dissimilar Hardware
Dissimilar Hardware
The Dissimilar Hardware Wizard in the unattended DR environment is used to inject Windows drivers into the recovering machine for any new hardware.
Search paths
Where the recovering machine has different hardware from the original system, the Dissimilar Hardware Wizard can detect the new devices and inject appropriate Windows drivers into the recovering machine ready for use when the restored machine re-boots (using Plug-and-Play).
Enter the path(s) where the new device drivers can be found during the unattended recovery
\\10.2.1.18\public\nigelp\drivers
Browse...
Note: separate multiple paths with a semicolon (;)
Type of devices to load
It is generally only necessary to inject drivers for mass storage and some network devices. Drivers for other device types (such as chipset, CPU type etc.) can be safely ignored and left for standard Windows Plug-and-Play processing on reboot. However if you wish to load all types of PCI devices, tick the following box.
Load all types of drivers
< Back
Next >
Cancel

Normally only mass storage and network controllers need to be considered. However, if all driver classes need to be examined select the *Load all types of drivers* tick box. Select **Next>** to continue to the *Advanced Options* dialog.


Cristie Answer File Creator - Advanced Options
Advanced Options
Specify the advanced options.
WARNING: Do not change these settings unless directed to by Cristie Support .
Map disks automatically
Update boot.ini
Omit LDM reservation
< Back
Next >
Cancel

Unless Cristie Support direct you to change these settings leave them at their default settings. Press **Next**> to continue to the Network Connection dialog. Here you can define a list of network connection credentials that will be used by automated DR to access any network shares identified in earlier dialogs (e.g. copy log files, DHW drivers etc.).

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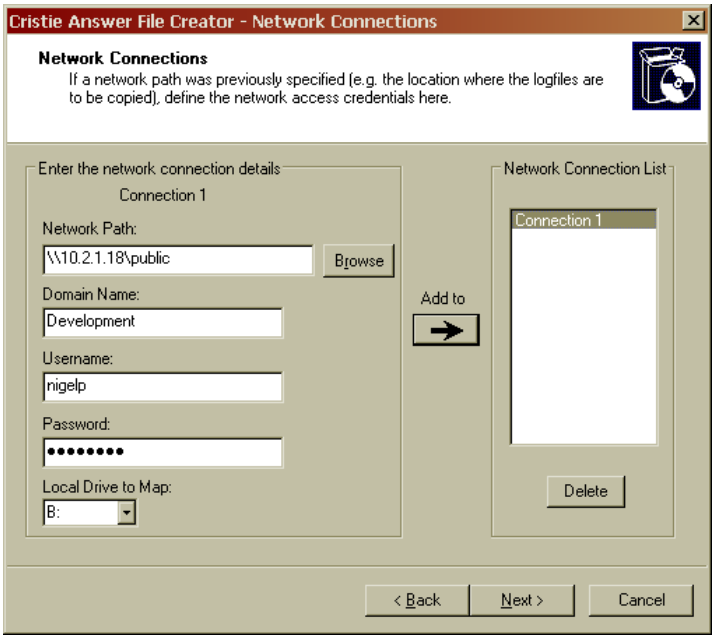
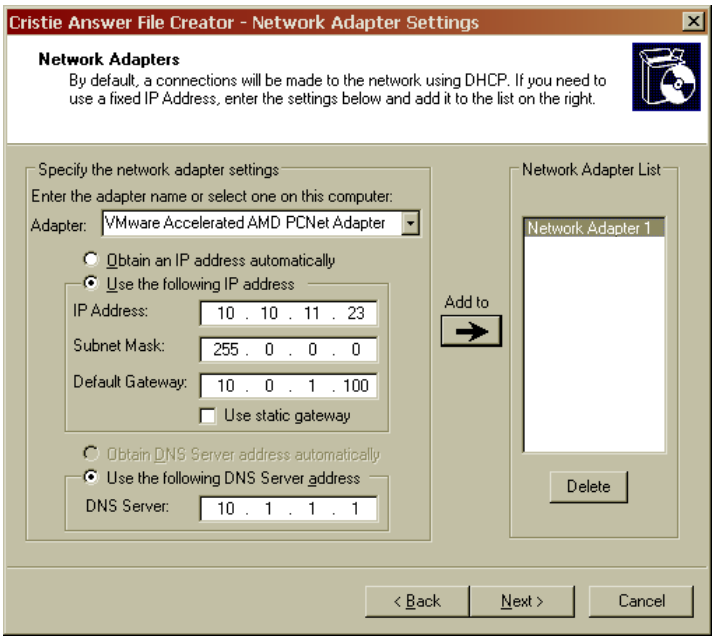


Press the **Add to->** button to add a new definition to the Connection list. Use the **Delete** button to remove an existing Connection definition. Press **Next>** to continue to the *Network Adapter* dialog.


Cristie Answer File Creator - Network Adapter Settings
Network Adapters
By default, a connections will be made to the network using DHCP. If you need to use a fixed IP Address, enter the settings below and add it to the list on the right.
Specify the network adapter settings
Enter the adapter name or select one on this computer:
Adapter:
VMware Accelerated AMD PCNet Adapter
Obtain an IP address automatically
Use the following IP address
IP Address:
10 . 10 . 11 . 23
Subnet Mask:
255 . 0 . 0 . 0
Default Gateway:
10 . 0 . 1 . 100
Use static gateway
Obtain DNS Server address automatically
Use the following DNS Server address
DNS Server:
10 . 1 . 1 . 1
Add to
Network Adapter List
Network Adapter 1
Delete
< Back
Next >
Cancel

Here you can specify how the default network settings should be setup in the PE DR environment at boot time. These settings apply to the recovery environment only - not the restored machine. Create a new Adapter name and associated network settings or use an existing network adapter and settings captured from the current host.

Press the **Add to->** button to add a new definition to the Adapter list. Use the **Delete** button to remove an existing Adapter definition. Press **Next>** to continue to the *Reboot Options* dialog.

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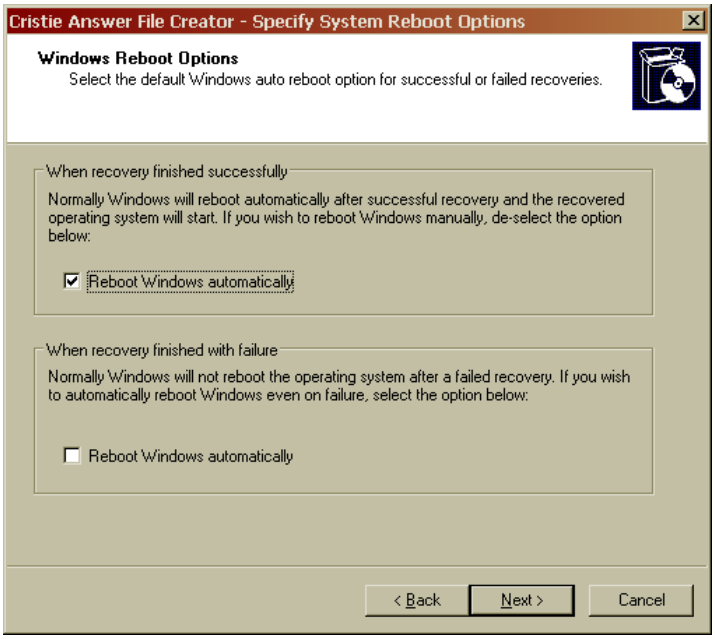
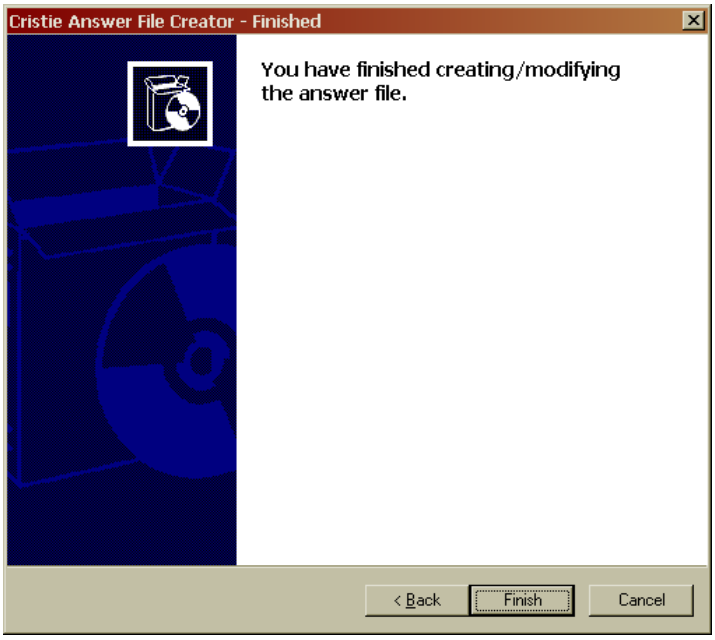

Cristie Answer File Creator - Specify System Reboot Options
Windows Reboot Options
Select the default Windows auto reboot option for successful or failed recoveries.
When recovery finished successfully
Normally Windows will reboot automatically after successful recovery and the recovered operating system will start. If you wish to reboot Windows manually, de-select the option below:
Reboot Windows automatically
When recovery finished with failure
Normally Windows will not reboot the operating system after a failed recovery. If you wish to automatically reboot Windows even on failure, select the option below:
Reboot Windows automatically
< Back
Next >
Cancel

Specify how the automated DR should handle the post recovery re-boot when the DR finishes with success or failure. If the DR is successful select the automatic re-boot option. If the DR fails it is unlikely that the re-boot will succeed so there is little point in proceeding with the re-boot. However if a re-boot should be attempted, even in a failure scenario, tick the failure auto re-boot option.

This is the last step in the answer file definition confirmed with the following dialog:



Select **Finish** to generate the answer file. A pop-up will be displayed prompting for the name and location of where the AFC should create the answer file.

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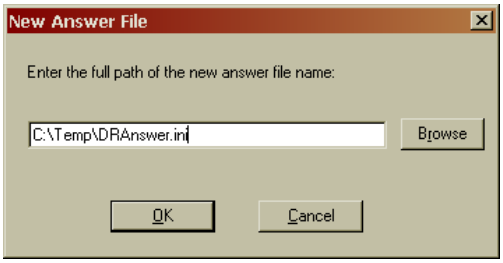

Select a path and press **OK**. This will create a file called `DRAnswer.ini` in the `C:\Temp` folder. The contents of a typical answer file is shown below for reference.

```
[ProductType]

Product = "TBMR"

[TbmrBackupLocation]

StorageType = "BackupSetTsm"
ServerName = "10.2.1.17"
ServerPort = 1500
NodeName = "NIGELPTBMR"
NodePassword = "Encrypted: 828211cf2ac6b2"
BackupSetName = "TEST.26463456"

[RestoreData]

Drives = "All"

[LogFiles]

RestoreLogDetailed = "No"
LogfileCopyPath = "\\10.2.1.18\public\nigelp\LOGS"

[NetLogin]

Connection1 = "params.Connection1"

[params.Connection1]

NetworkPath = "\\10.2.1.18\public"
Domain = "Development"
Username = "nigelp"
Password = "Encrypted: 95860a8f6b9fbe1f"
MapToDrive = "B:"

[NetAdapters]

Adapter1 = "params.Adapter1"

[params.Adapter1]

AdapterName = "VMware Accelerated AMD PCNet Adapter"
IPAddress = "10.10.11.23"
SubnetMask = "255.0.0.0"
Gateway = "10.0.1.100"
DnsServer = "10.1.1.1"

[System]
```

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```
RebootOnSuccess = "True"
RebootOnFailure = "False"

[DiskOperation]

PartitionDisk = "All"

[DissimilarHardware]

DriverPaths = "\\10.2.1.18\public\nigelp\drivers"
```

Note that the answer file MUST be called DRAnswer.ini when transferred to the ISO.

2.5 Prepare Boot Media For Automated Recovery

To prepare boot media for automated recovery the boot image must be customised to both auto boot and add the answer file to an expected location. The auto boot modification is required because normally the PE/PE2 distribution media is designed to prompt for DR boot. By default it will not boot into DR unless a key is pressed. If no key is pressed any installed OS is booted instead. This behaviour needs to be suppressed for automated recoveries. This is described in Customise Boot Media For Auto Boot.

If the answer file needs to be added to TBMR boot media itself an ISO editing tool such as *MagicISO* or *UltraISO* is required. This is then used to extract the Windows PE boot file from the distribution ISO image. It can also be used to create the new modified ISO image containing the answer file.

During an automated DR sequence the Windows PE environment will search for the answer file in one of these locations and in this order of precedence:

1. The root folder of the Windows PE/PE2 boot environment (always drive X: when booted)
2. The root folder of the CD/DVD containing the TBMR distribution media
3. The root folder of any locally attached removable storage

As soon as a suitable answer file is found in one of these locations the search stops and that answer file is used to control the automated DR process. If no answer file is found the normal interactive DR GUI is started. Refer to sections Add Answer File To Product ISO Root Folder and Add Answer File to Boot Image Root Folder for a discussion on how this is achieved.

The boot image created for option 1 is suitable for network boot, but requires the standard TBMR boot image to be customised (this is an ISO in PE and a WIM in PE2).

Use option 3 when customising the boot image is not practical. In this case simply copy the generated answer file to the root folder on suitable removable storage (e.g. USB disk).

Note the answer file will only be detected during boot if the file is located in one of the 3 locations specified above.

2.5.1 Customise Boot Media For Auto Boot

By default both the PE and PE2 distribution media will display a prompt to boot into the DR environment when auto-run. If no key is pressed any alternative installed OS is booted instead. For automated DR this behaviour needs to be suppressed.

At the moment the only way to do this is to customise the TBMR distribution media. This section

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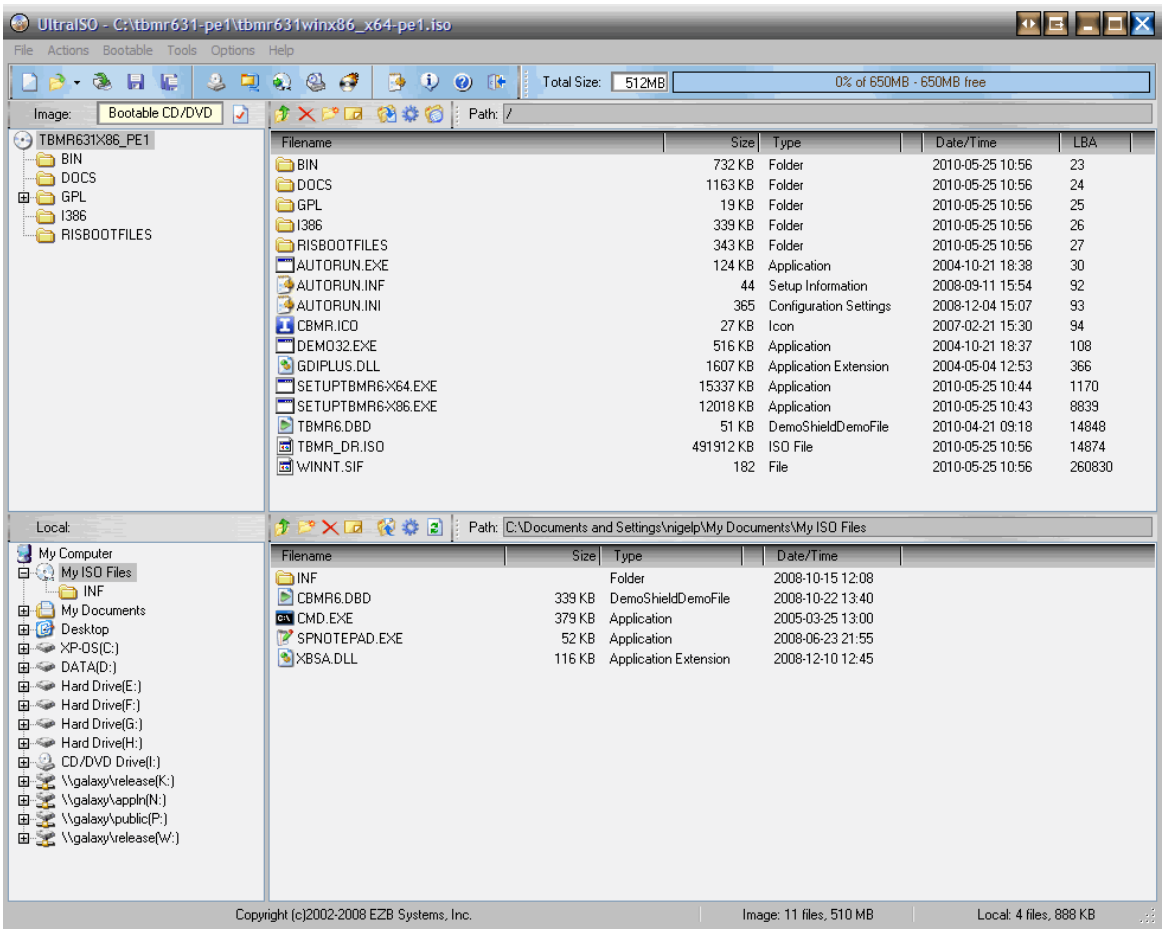
describes how to achieve this for both PE and PE2 environments.

2.5.1.1 Windows PE

To customise the Windows PE ISO image for auto boot open the product PE distribution media image with your ISO editor:


UltraISO - C:\tbmr631-pe1\tbmr631winx86_x64-pe1.iso
File Actions Bootable Tools Options Help
Total Size: 512MB
0% of 650MB - 650MB free
Image: Bootable CD/DVD
Path: /
TBMR631X86_PE1
BIN
DOCS
GPL
I386
RISBOOTFILES
Filename Size Type Date/Time LBA
BIN 732 KB Folder 2010-05-25 10:56 23
DOCS 1163 KB Folder 2010-05-25 10:56 24
GPL 19 KB Folder 2010-05-25 10:56 25
I386 339 KB Folder 2010-05-25 10:56 26
RISBOOTFILES 343 KB Folder 2010-05-25 10:56 27
AUTORUN.EXE 124 KB Application 2004-10-21 18:38 30
AUTORUN.INF 44 Setup Information 2008-09-11 15:54 92
AUTORUN.INI 365 Configuration Settings 2008-12-04 15:07 93
CBMR.ICO 27 KB Icon 2007-02-21 15:30 94
DEMO32.EXE 516 KB Application 2004-10-21 18:37 108
GDIPLUS.DLL 1607 KB Application Extension 2004-05-04 12:53 366
SETUPTBMR6-X64.EXE 15337 KB Application 2010-05-25 10:44 1170
SETUPTBMR6-X86.EXE 12018 KB Application 2010-05-25 10:43 8839
TBMR6.DBD 51 KB DemoShieldDemoFile 2010-04-21 09:18 14848
TBMR_DR.ISO 491912 KB ISO File 2010-05-25 10:56 14874
WINNT.SIF 182 File 2010-05-25 10:56 260830
Local:
Path: C:\Documents and Settings\nigelp\My Documents\My ISO Files
My Computer
My ISO Files
INF
My Documents
Desktop
XP-OS(C:)
DATA(D:)
Hard Drive(E:)
Hard Drive(F:)
Hard Drive(G:)
Hard Drive(H:)
CD/DVD Drive(I:)
\\galaxy\release(K:)
\\galaxy\appln(N:)
\\galaxy\public(P:)
\\galaxy\release(W:)
Filename Size Type Date/Time
INF Folder 2008-10-15 12:08
CBMR6.DBD 339 KB DemoShieldDemoFile 2008-10-22 13:40
CMD.EXE 379 KB Application 2005-03-25 13:00
SPNOTEPAD.EXE 52 KB Application 2008-06-23 21:55
XBSA.DLL 116 KB Application Extension 2008-12-10 12:45
Copyright (c)2002-2008 EZB Systems, Inc.
Image: 11 files, 510 MB
Local: 4 files, 888 KB

Navigate to the I386 folder thus:

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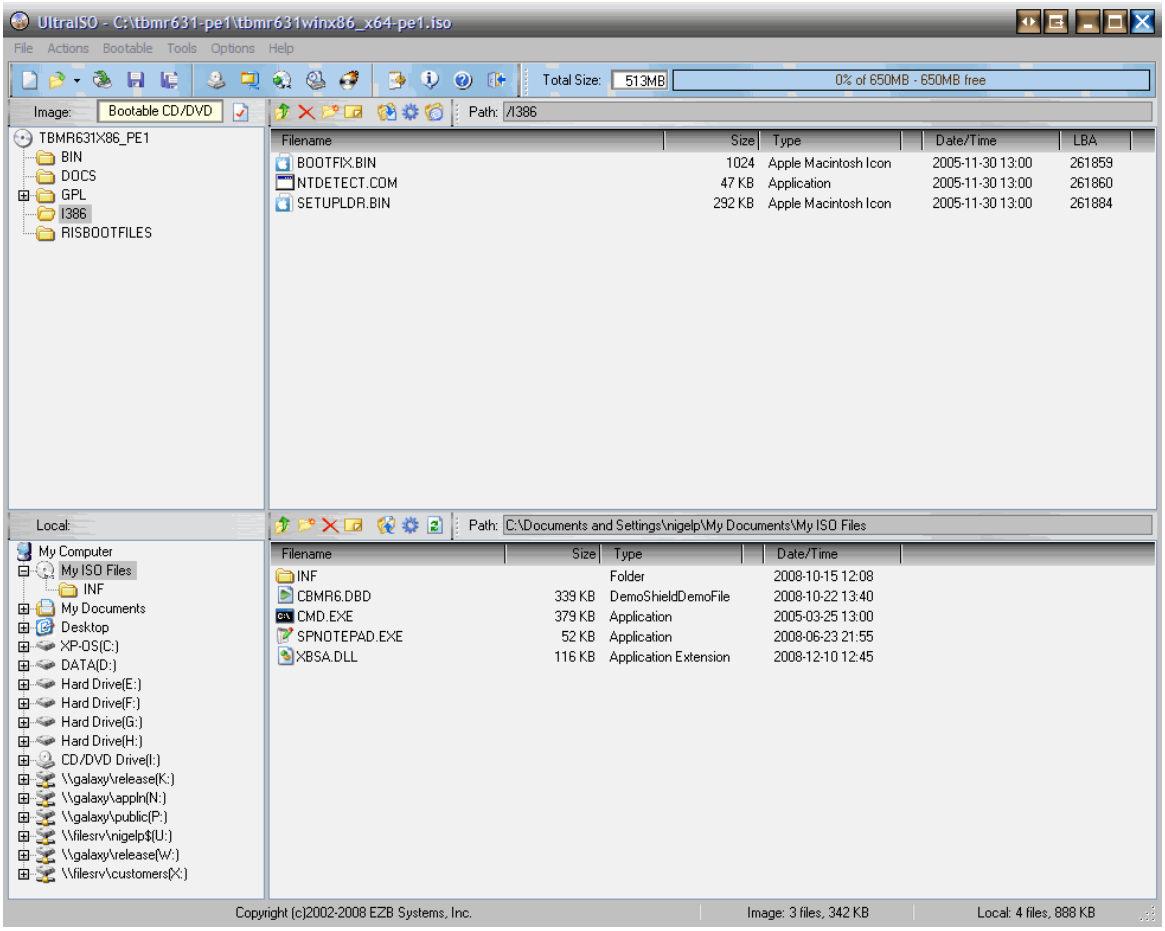

Right click on the file `BOOTFIX.BIN` in this folder and select Delete in the pop-up menu.

Finally save the modified ISO. This action will create a new ISO with the `BOOTFIX.BIN` file removed. This modified PE ISO will now automatically boot into the PE environment without having to press a key first.

2.5.1.2 Windows PE2

The steps required to customise the Windows PE2 ISO image for auto boot are as follows.

Open the product PE2 distribution media image with your ISO editor:

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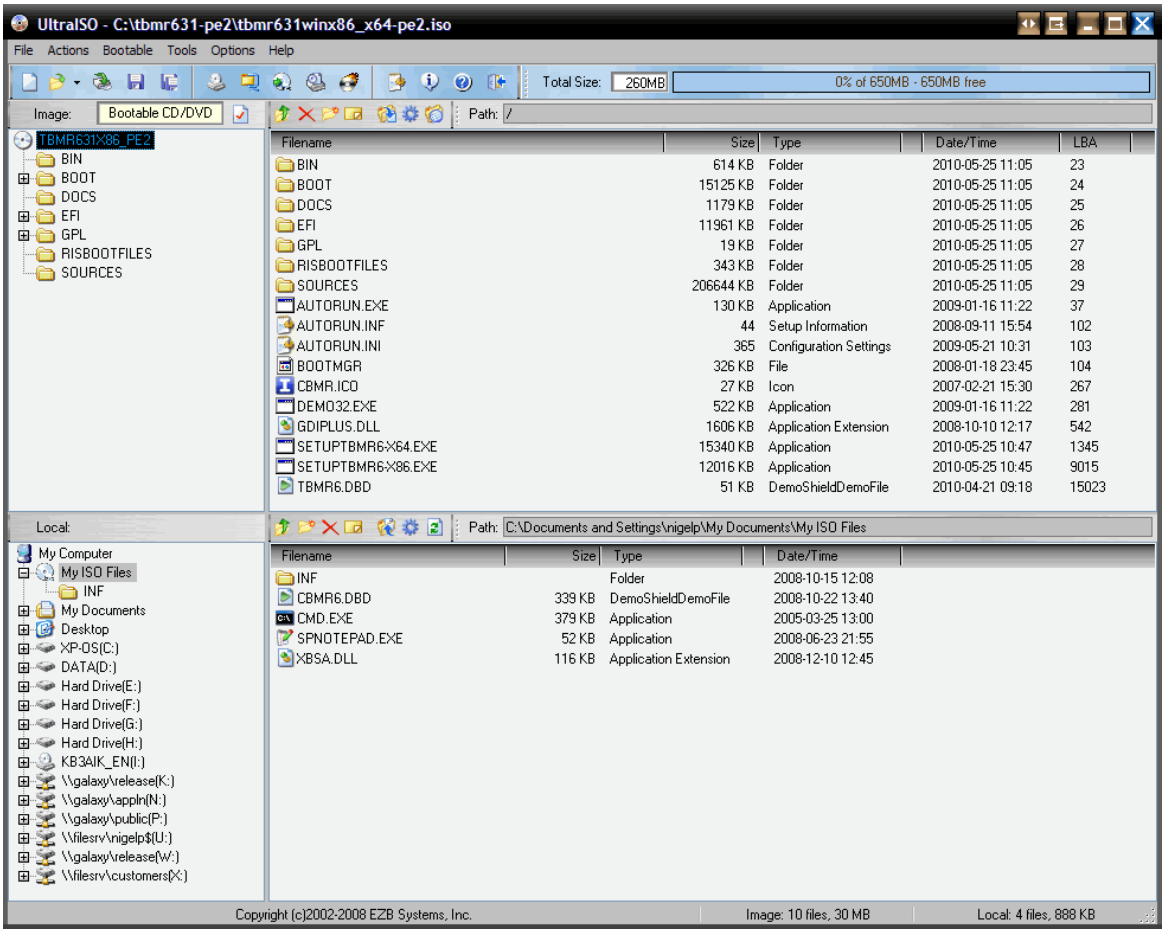

Then navigate to the `BOOT` folder thus:

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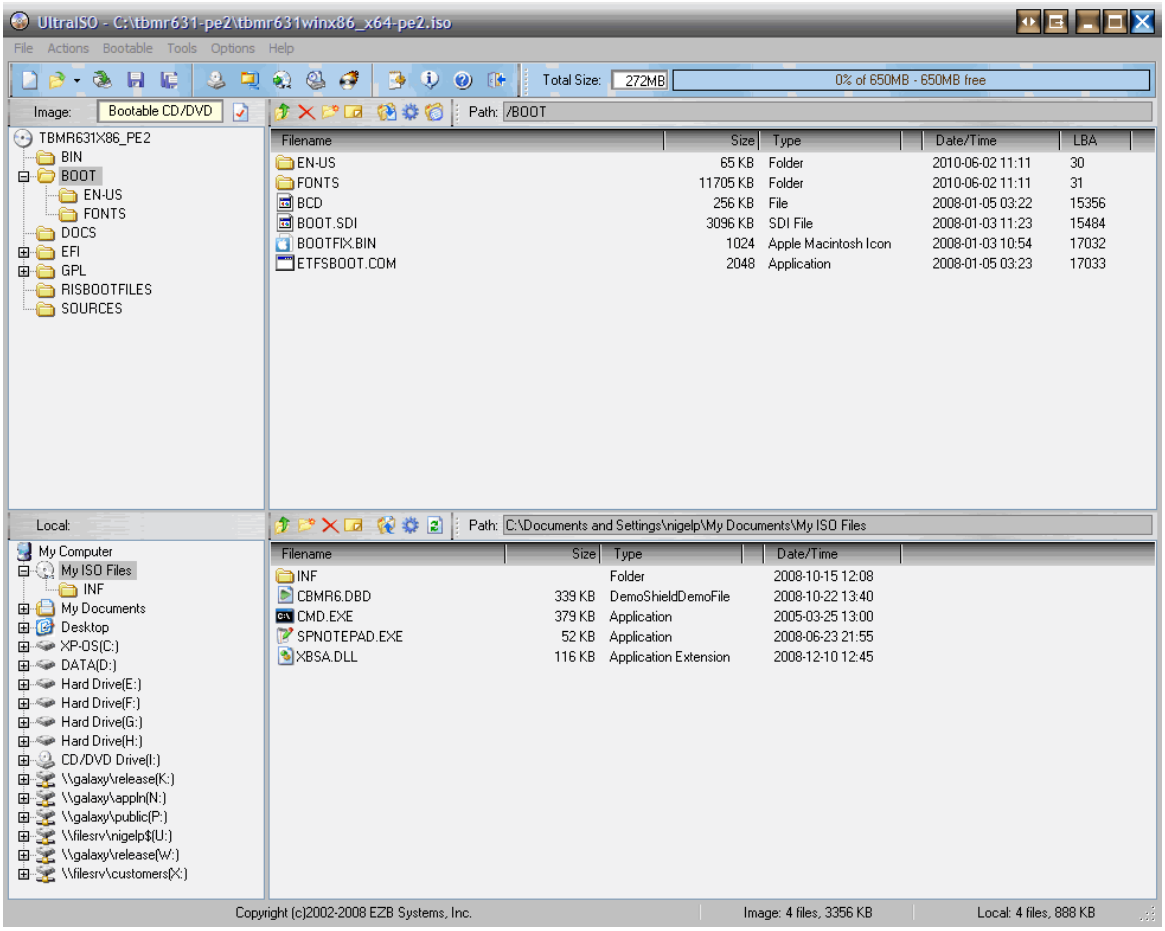

Right click on the file `BOOTFIX.BIN` in this folder and select Delete in the pop-up menu.

Finally save the modified ISO. This action will create a new ISO with the `BOOTFIX.BIN` file removed. This modified PE2 ISO will now automatically boot into the PE2 environment.

2.5.2 Add Answer File To Product ISO Root Folder

To add the answer file to the root folder of the boot image follow these steps.

Open the distribution media image with your ISO editor:

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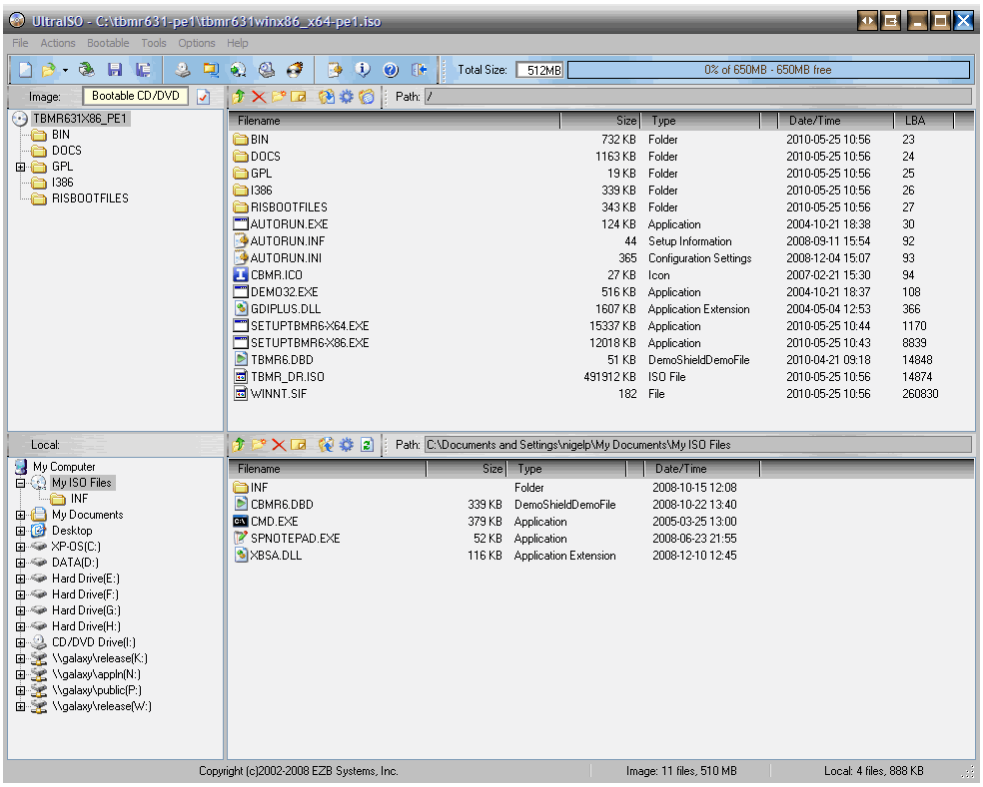
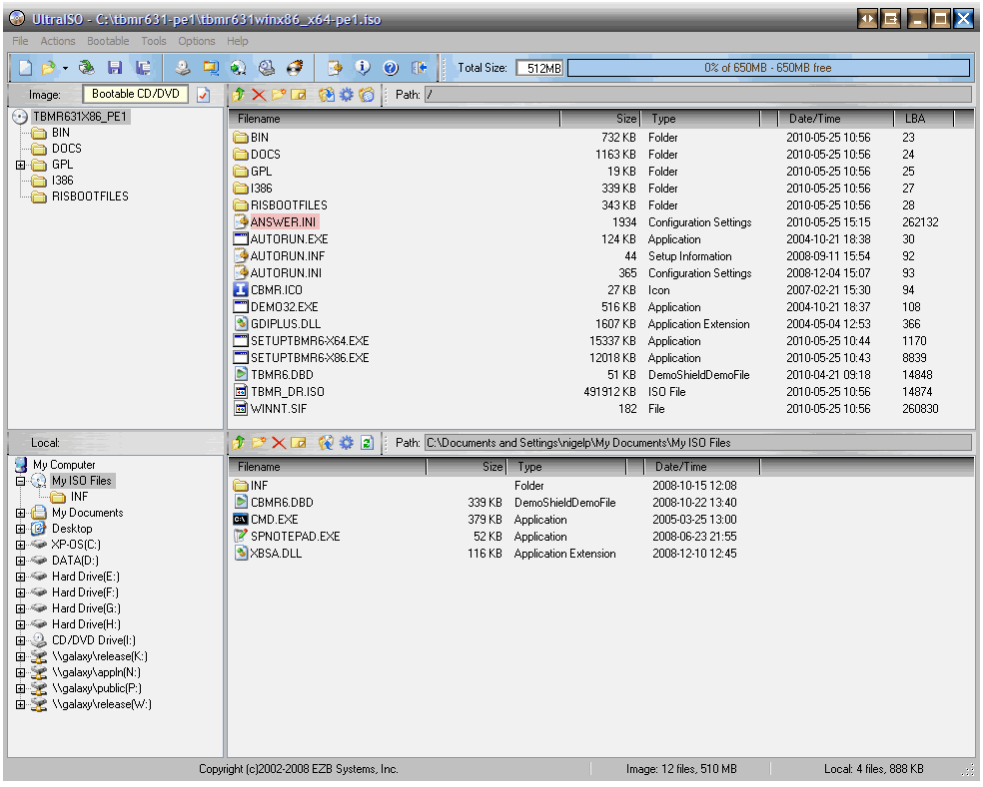

UltraISO - C:\tbmr631-pe1\tbmr631winx86_x64-pe1.iso
File Actions Bootable Tools Options Help
Total Size: 512MB
0% of 650MB - 650MB free
Image: Bootable CD/DVD
Path: /
TBMR631X86_PE1
BIN
DOCS
GPL
I386
RISBOOTFILES
Filename Size Type Date/Time LBA
BIN 732 KB Folder 2010-05-25 10:56 23
DOCS 1163 KB Folder 2010-05-25 10:56 24
GPL 19 KB Folder 2010-05-25 10:56 25
I386 339 KB Folder 2010-05-25 10:56 26
RISBOOTFILES 343 KB Folder 2010-05-25 10:56 27
AUTORUN.EXE 124 KB Application 2004-10-21 18:38 30
AUTORUN.INF 44 Setup Information 2008-09-11 15:54 92
AUTORUN.INI 365 Configuration Settings 2008-12-04 15:07 93
CBMR.ICO 27 KB Icon 2007-02-21 15:30 94
DEMO32.EXE 516 KB Application 2004-10-21 18:37 108
GDIPLUS.DLL 1607 KB Application Extension 2004-05-04 12:53 366
SETUPTBMR6-X64.EXE 15337 KB Application 2010-05-25 10:44 1170
SETUPTBMR6-X86.EXE 12018 KB Application 2010-05-25 10:43 8839
TBMR6.DBD 51 KB DemoShieldDemoFile 2010-04-21 09:18 14848
TBMR_DR.ISO 491912 KB ISO File 2010-05-25 10:56 14874
WINNT.SIF 182 File 2010-05-25 10:56 260830
Local:
Path: C:\Documents and Settings\nigelp\My Documents\My ISO Files
My Computer
My ISO Files
INF
My Documents
Desktop
XP-OS(C:)
DATA(D:)
Hard Drive(E:)
Hard Drive(F:)
Hard Drive(G:)
Hard Drive(H:)
CD/DVD Drive(I:)
\\galaxy\release(K:)
\\galaxy\appln(N:)
\\galaxy\public(P:)
\\galaxy\release(W:)
Filename Size Type Date/Time
INF Folder 2008-10-15 12:08
CBMR6.DBD 339 KB DemoShieldDemoFile 2008-10-22 13:40
CMD.EXE 379 KB Application 2005-03-25 13:00
SPNOTEPAD.EXE 52 KB Application 2008-06-23 21:55
XBSA.DLL 116 KB Application Extension 2008-12-10 12:45
Copyright (c)2002-2008 EZB Systems, Inc.
Image: 11 files, 510 MB
Local: 4 files, 888 KB

Drag and drop your answer file into the root of the ISO:


UltraISO - C:\tbmr631-pe1\tbmr631winx86_x64-pe1.iso
File Actions Bootable Tools Options Help
Total Size: 512MB
0% of 650MB - 650MB free
Image: Bootable CD/DVD
Path: /
TBMR631X86_PE1
BIN
DOCS
GPL
I386
RISBOOTFILES
Filename Size Type Date/Time LBA
BIN 732 KB Folder 2010-05-25 10:56 23
DOCS 1163 KB Folder 2010-05-25 10:56 24
GPL 19 KB Folder 2010-05-25 10:56 25
I386 339 KB Folder 2010-05-25 10:56 27
RISBOOTFILES 343 KB Folder 2010-05-25 10:56 28
ANSWER.INI 1934 Configuration Settings 2010-05-25 15:15 262132
AUTORUN.EXE 124 KB Application 2004-10-21 18:38 30
AUTORUN.INF 44 Setup Information 2008-09-11 15:54 92
AUTORUN.INI 365 Configuration Settings 2008-12-04 15:07 93
CBMR.ICO 27 KB Icon 2007-02-21 15:30 94
DEMO32.EXE 516 KB Application 2004-10-21 18:37 108
GDIPLUS.DLL 1607 KB Application Extension 2004-05-04 12:53 366
SETUPTBMR6-X64.EXE 15337 KB Application 2010-05-25 10:44 1170
SETUPTBMR6-X86.EXE 12018 KB Application 2010-05-25 10:43 8839
TBMR6.DBD 51 KB DemoShieldDemoFile 2010-04-21 09:18 14848
TBMR_DR.ISO 491912 KB ISO File 2010-05-25 10:56 14874
WINNT.SIF 182 File 2010-05-25 10:56 260830
Local:
Path: C:\Documents and Settings\nigelp\My Documents\My ISO Files
My Computer
My ISO Files
INF
My Documents
Desktop
XP-OS(C:)
DATA(D:)
Hard Drive(E:)
Hard Drive(F:)
Hard Drive(G:)
Hard Drive(H:)
CD/DVD Drive(I:)
\\galaxy\release(K:)
\\galaxy\appln(N:)
\\galaxy\public(P:)
\\galaxy\release(W:)
Filename Size Type Date/Time
INF Folder 2008-10-15 12:08
CBMR6.DBD 339 KB DemoShieldDemoFile 2008-10-22 13:40
CMD.EXE 379 KB Application 2005-03-25 13:00
SPNOTEPAD.EXE 52 KB Application 2008-06-23 21:55
XBSA.DLL 116 KB Application Extension 2008-12-10 12:45
Copyright (c)2002-2008 EZB Systems, Inc.
Image: 12 files, 510 MB
Local: 4 files, 888 KB

Now save the new ISO image to a new file or overwrite the existing image. Use this new ISO image to create new physical CD/DVDs as required. Although the example shown depicts a Windows PE boot ISO image the same process applies to a PE2 ISO image.

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2.5.3 Add Answer File to Boot Image Root Folder

The steps required to modify the boot image to add the answer file to the root folder are slightly different depending upon whether Windows PE or PE2 is being used for the recovery.

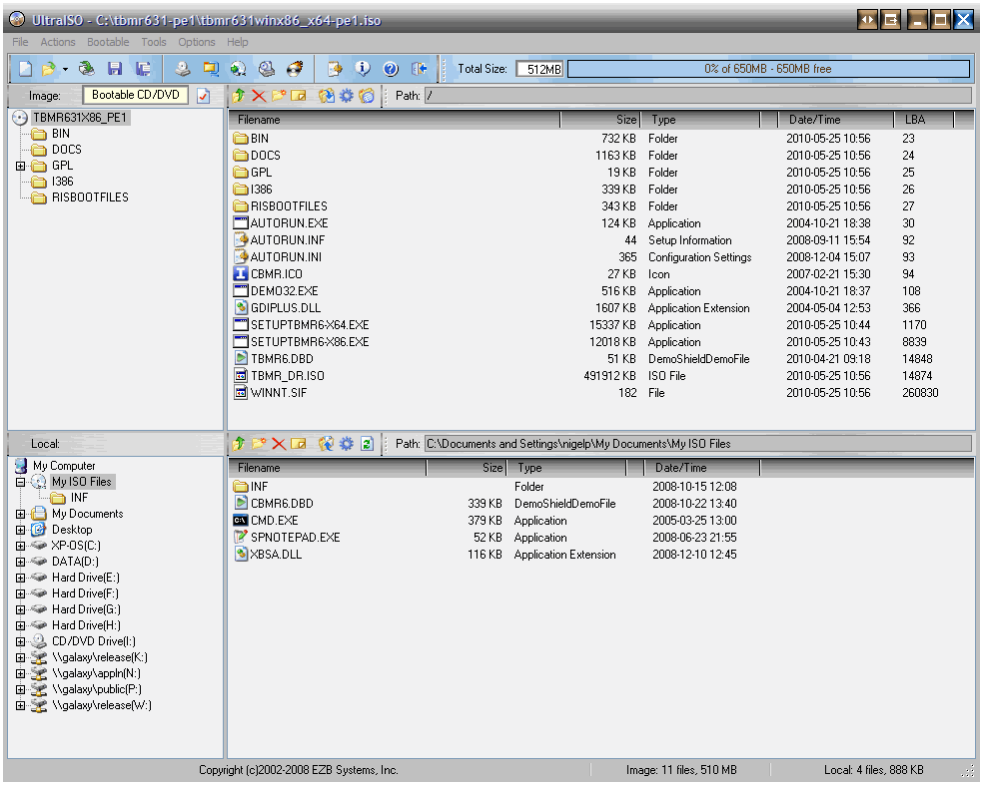
The PE boot image is in standard ISO form and so an ISO image editor program can be used to extract the boot ISO file from the product distribution media
and add the answer file.

The PE 2 boot image is in Microsoft WIM file format. Use an ISO editor to extract the WIM file from the product distribution media and use the Microsoft Windows Automated Installation Kit (WAIK) tools to add the answer file.

2.5.3.1 Windows PE

The steps required to add the answer file to the Windows PE ISO image are as follows.

Open the product PE distribution media image with your ISO editor:


UltraISO - C:\tbmr631-pe1\tbmr631winx86_x64-pe1.iso
File Actions Bootable Tools Options Help
Total Size: 512MB
0% of 650MB - 650MB free
Image: Bootable CD/DVD
Path: /
TBMR631X86_PE1
BIN
DOCS
GPL
I386
RISBOOTFILES
Filename Size Type Date/Time LBA
BIN 732 KB Folder 2010-05-25 10:56 23
DOCS 1163 KB Folder 2010-05-25 10:56 24
GPL 19 KB Folder 2010-05-25 10:56 25
I386 339 KB Folder 2010-05-25 10:56 26
RISBOOTFILES 343 KB Folder 2010-05-25 10:56 27
AUTORUN.EXE 124 KB Application 2004-10-21 18:38 30
AUTORUN.INF 44 Setup Information 2008-09-11 15:54 92
AUTORUN.INI 365 Configuration Settings 2008-12-04 15:07 93
CBMR.ICO 27 KB Icon 2007-02-21 15:30 94
DEMO32.EXE 516 KB Application 2004-10-21 18:37 108
GDIPLUS.DLL 1607 KB Application Extension 2004-05-04 12:53 366
SETUPTBMR6-X64.EXE 15337 KB Application 2010-05-25 10:44 1170
SETUPTBMR6-X86.EXE 12018 KB Application 2010-05-25 10:43 8839
TBMR6.DBD 51 KB DemoShieldDemoFile 2010-04-21 09:18 14848
TBMR_DR.ISO 491912 KB ISO File 2010-05-25 10:56 14874
WINNT.SIF 182 File 2010-05-25 10:56 260830
Local:
Path: C:\Documents and Settings\nigelp\My Documents\My ISO Files
My Computer
My ISO Files
INF
My Documents
Desktop
XP-OS(C:)
DATA(D:)
Hard Drive(E:)
Hard Drive(F:)
Hard Drive(G:)
Hard Drive(H:)
CD/DVD Drive(I:)
\\galaxy\release(K:)
\\galaxy\appln(N:)
\\galaxy\public(P:)
\\galaxy\release(W:)
Filename Size Type Date/Time
INF Folder 2008-10-15 12:08
CBMR6.DBD 339 KB DemoShieldDemoFile 2008-10-22 13:40
CMD.EXE 379 KB Application 2005-03-25 13:00
SPNOTEPAD.EXE 52 KB Application 2008-06-23 21:55
XBSA.DLL 116 KB Application Extension 2008-12-10 12:45
Copyright (c)2002-2008 EZB Systems, Inc.
Image: 11 files, 510 MB
Local: 4 files, 888 KB

Extract the file called *TBMR_DR.ISO* from the Windows PE image. This is the PE boot image which should then, in turn, be opened with your ISO editor.

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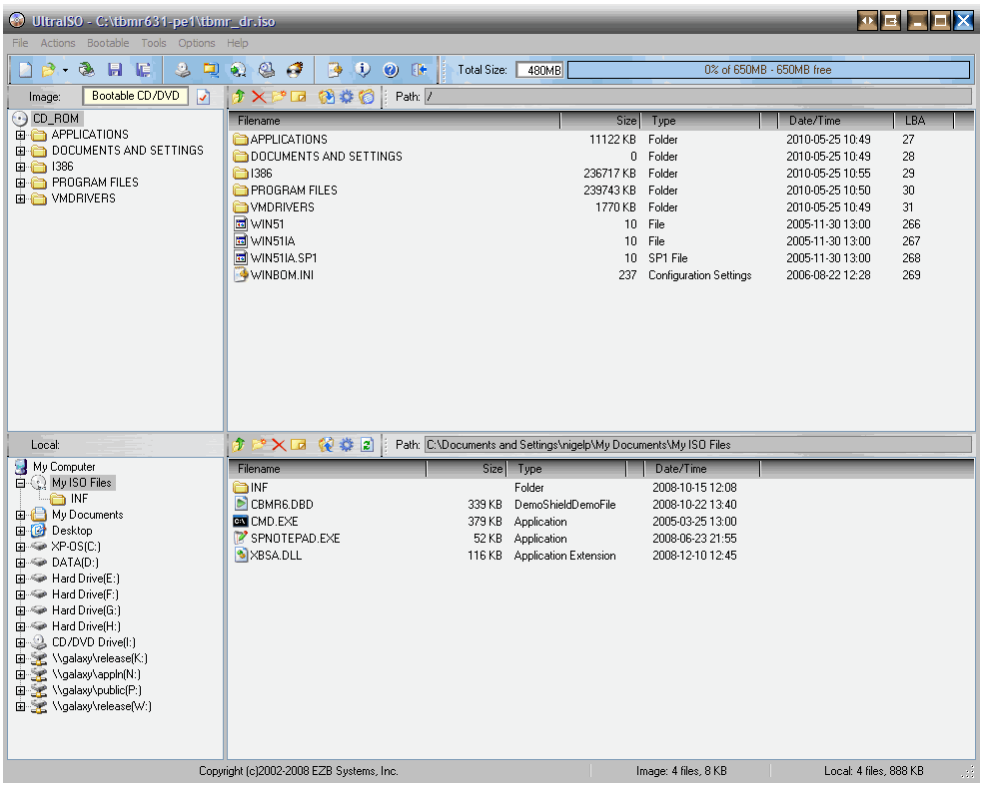
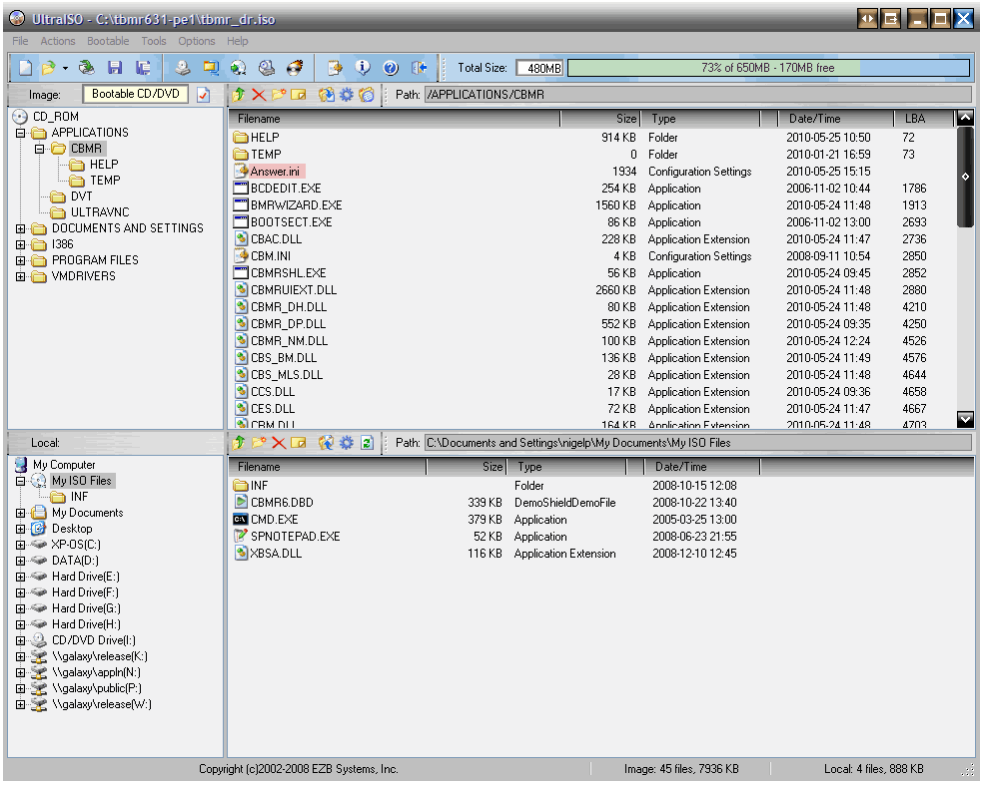


Browse to the *APPLICATIONS\CBMR* folder and drag and drop the answer file into this folder.


UltraISO - C:\tbmr631-pe1\tbmr_dr.iso
File Actions Bootable Tools Options Help
Total Size: 480MB
73% of 650MB - 170MB free
Image: Bootable CD/DVD
Path: /APPLICATIONS/CBMR
CD_ROM
APPLICATIONS
CBMR
HELP
TEMP
DVT
ULTRAVNC
DOCUMENTS AND SETTINGS
I386
PROGRAM FILES
VMDRIVERS
Filename Size Type Date/Time LBA
HELP 914 KB Folder 2010-05-25 10:50 72
TEMP 0 Folder 2010-01-21 16:59 73
Answer.ini 1934 Configuration Settings 2010-05-25 15:15
BCDEDIT.EXE 254 KB Application 2006-11-02 10:44 1786
BMRWIZARD.EXE 1560 KB Application 2010-05-24 11:48 1913
BOOTSECT.EXE 86 KB Application 2006-11-02 13:00 2693
CBAC.DLL 228 KB Application Extension 2010-05-24 11:47 2736
CBM.INI 4 KB Configuration Settings 2008-09-11 10:54 2850
CBMRSHL.EXE 56 KB Application 2010-05-24 09:45 2852
CBMRUIEXT.DLL 2660 KB Application Extension 2010-05-24 11:48 2880
CBMR_DH.DLL 80 KB Application Extension 2010-05-24 11:48 4210
CBMR_DP.DLL 552 KB Application Extension 2010-05-24 09:35 4250
CBMR_NM.DLL 100 KB Application Extension 2010-05-24 12:24 4526
CBS_BM.DLL 136 KB Application Extension 2010-05-24 11:49 4576
CBS_MLS.DLL 28 KB Application Extension 2010-05-24 11:48 4644
CCS.DLL 17 KB Application Extension 2010-05-24 09:36 4658
CES.DLL 72 KB Application Extension 2010-05-24 11:47 4667
Local:
Path: C:\Documents and Settings\nigelp\My Documents\My ISO Files
My Computer
My ISO Files
INF
My Documents
Desktop
XP-OS(C:)
DATA(D:)
Hard Drive(E:)
Hard Drive(F:)
Hard Drive(G:)
Hard Drive(H:)
CD/DVD Drive(I:)
\\galaxy\release(K:)
\\galaxy\appln(N:)
\\galaxy\public(P:)
\\galaxy\release(W:)
Filename Size Type Date/Time
INF Folder 2008-10-15 12:08
CBMR6.DBD 339 KB DemoShieldDemoFile 2008-10-22 13:40
CMD.EXE 379 KB Application 2005-03-25 13:00
SPNOTEPAD.EXE 52 KB Application 2008-06-23 21:55
XBSA.DLL 116 KB Application Extension 2008-12-10 12:45
Copyright (c)2002-2008 EZB Systems, Inc.
Image: 45 files, 7936 KB
Local: 4 files, 888 KB

Now save the new ISO image to a new file or overwrite the existing image. Use this new ISO image to create new physical CD/DVDs as required. There is no need to add this modified *TBMR_DR.ISO back into the distribution media ISO.*

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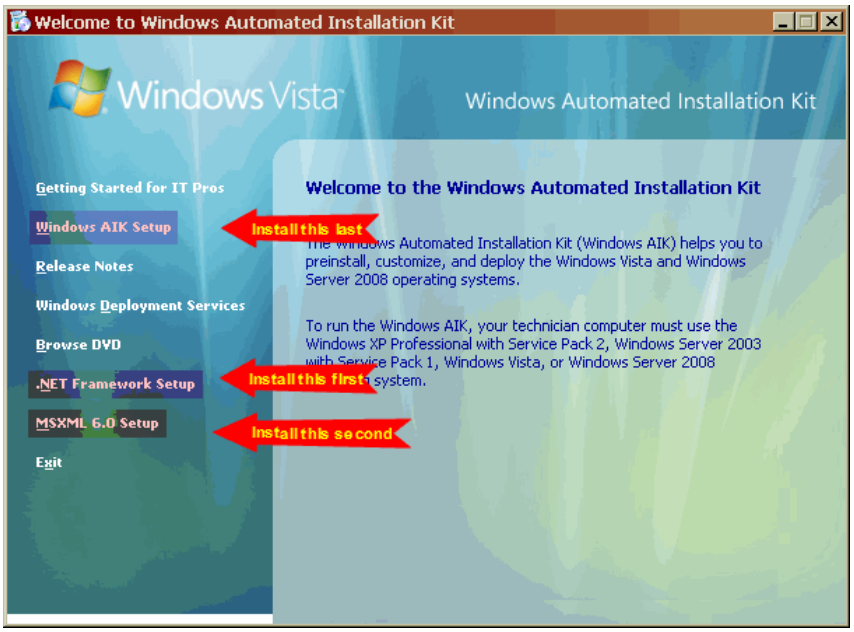
2.5.3.2 Windows PE2

The PE 2 boot image is in WIM file format and can only be modified by using the Microsoft Windows Automated Installation Kit (WAIK). Download the WAIK version 1.1 (dated 25/2/2008) from the Microsoft Download Center. This is the February 2008 update.

The downloaded image (in .IMG format) should be burnt to a DVD (its too large for a CD) and installed on a suitable PC. Run the .NET 2.0, MSXML 6.0 and Windows AIK Setup options in that order.


Welcome to Windows Automated Installation Kit
Windows Vista
Windows Automated Installation Kit
Getting Started for IT Pros
Windows AIK Setup
Release Notes
Windows Deployment Services
Browse DVD
.NET Framework Setup
MSXML 6.0 Setup
Exit
Install this last
Install this first
Install this second
Welcome to the Windows Automated Installation Kit
The Windows Automated Installation Kit (Windows AIK) helps you to preinstall, customize, and deploy the Windows Vista and Windows Server 2008 operating systems.
To run the Windows AIK, your technician computer must use the Windows XP Professional with Service Pack 2, Windows Server 2003 with Service Pack 1, Windows Vista, or Windows Server 2008 system.

With the WAIK successfully installed, the steps required to modify the Windows PE 2 WIM image are as follows.

Open the product PE 2 distribution media image with your ISO editor:

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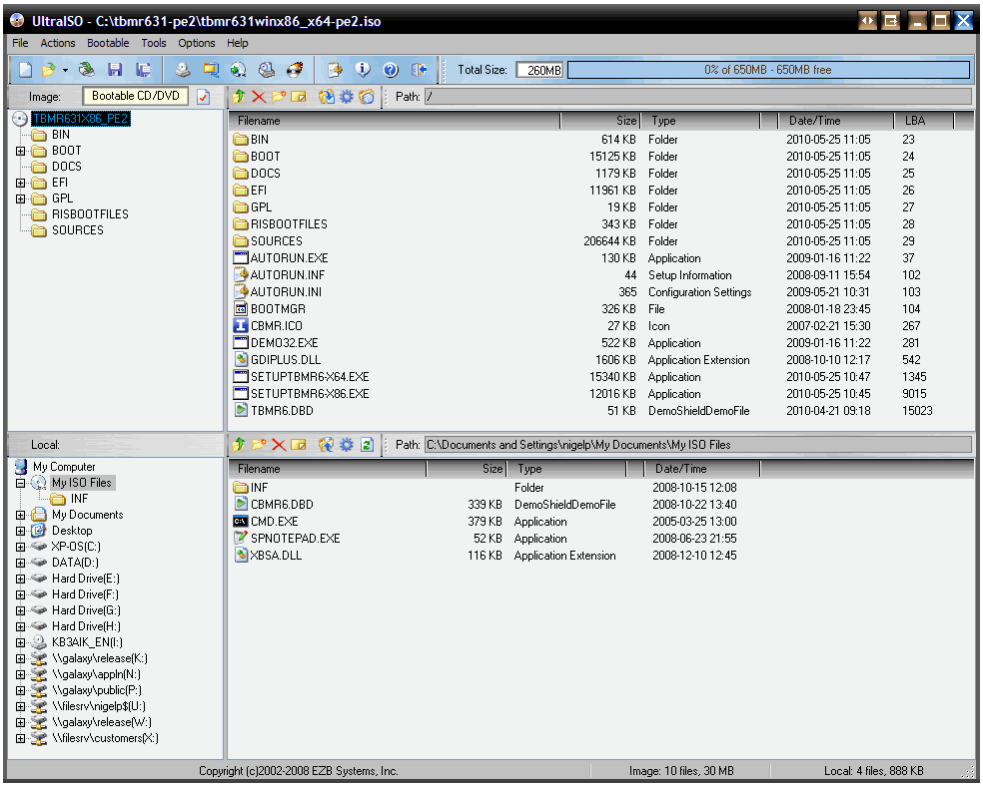
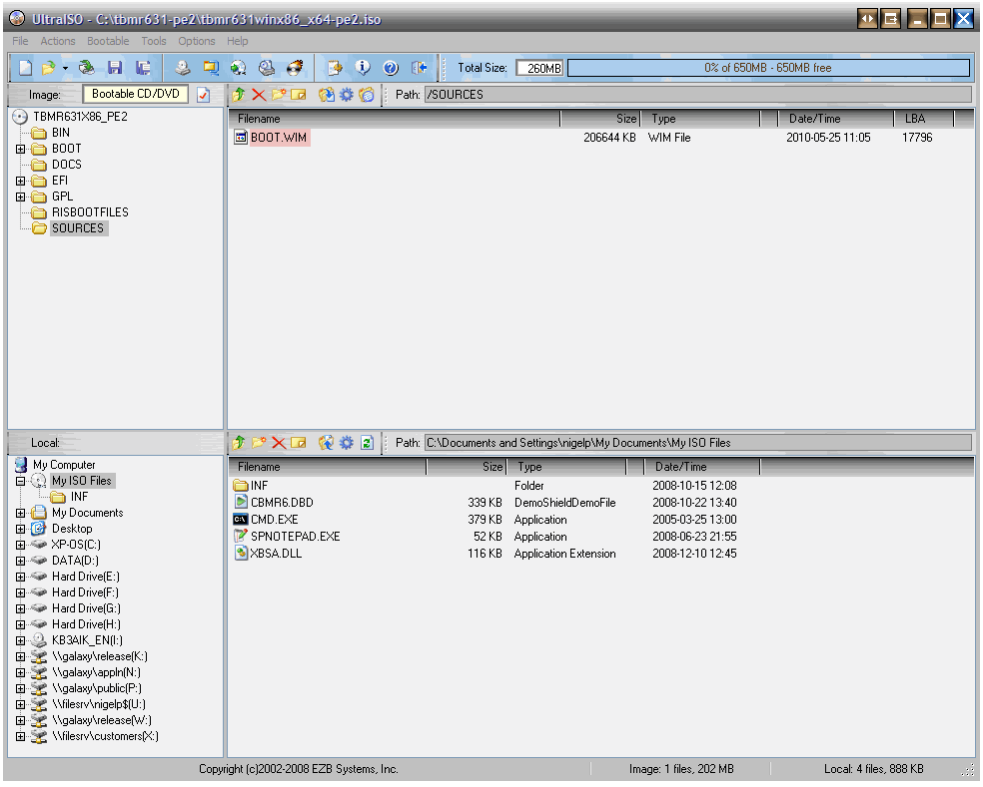


Navigate to the `\SOURCES` folder and extract the file `BOOT.WIM` to a convenient location.



The following description assumes the `BOOT.WIM` file has been extracted to `C:\Temp`. It also assumes that the answer file is also in `C:\Temp`. The WIM is edited by mounting the image onto a standard folder in the file system. Once this is done the answer file can be simply copied into the target folder and the image unmounted. It is therefore necessary to create a folder where the WIM image will be mounted. This folder must be empty. the WAIK tool used to modify the WIM image is

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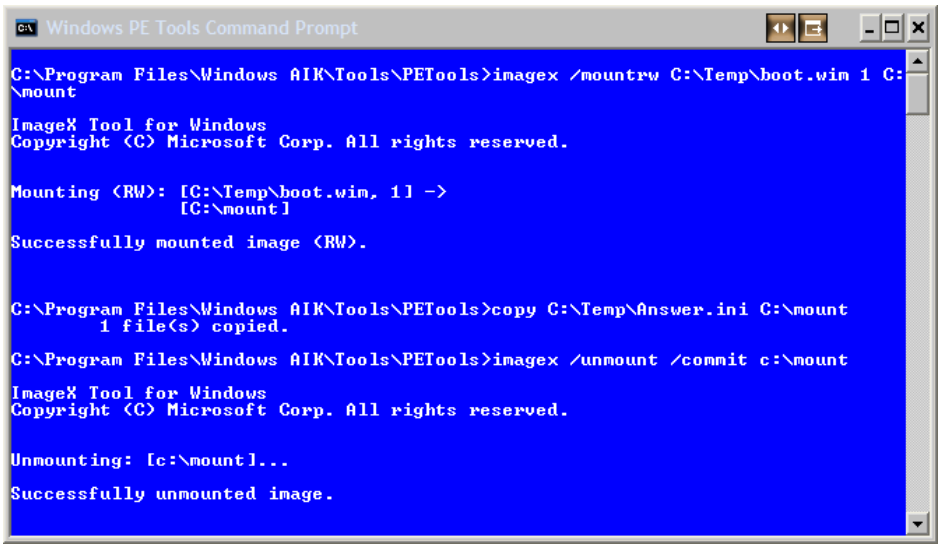
called *ImageX*.

Now run a *Windows PE Tools Command* window (a shortcut for this is normally created on the Desktop by the WAIK installation) and enter the commands:

```
imagex /mountrw C:\Temp\boot.wim 1 C:\mount

copy C:\Temp\DRAnswer.ini C:\mount

imagex /unmount /commit C:\mount
```


Windows PE Tools Command Prompt
C:\Program Files\Windows AIK\Tools\PETools>imagex /mountrw C:\Temp\boot.wim 1 C:\mount
ImageX Tool for Windows
Copyright (C) Microsoft Corp. All rights reserved.
Mounting (RW): [C:\Temp\boot.wim, 1] ->
[C:\mount]
Successfully mounted image (RW).
C:\Program Files\Windows AIK\Tools\PETools>copy C:\Temp\Answer.ini C:\mount
1 file(s) copied.
C:\Program Files\Windows AIK\Tools\PETools>imagex /unmount /commit c:\mount
ImageX Tool for Windows
Copyright (C) Microsoft Corp. All rights reserved.
Unmounting: [c:\mount]...
Successfully unmounted image.

The modified WIM file can then be either added back into the product ISO or kept and used in conjunction with Windows Deployment Services (WDS) for remote network boot. If required use the ISO editor to write the WIM file back into the product ISO in the `\SOURCES` folder.

Note that the answer file MUST be called DRAnswer.ini when transferred to the ISO.

3 Recovery

An automated recovery can be initiated either by a network or CD/DVD boot of the customised TBMR boot image as described in Prepare Boot Media For Automated Recovery.

Starting the boot process is the only part of the restore process that requires manual intervention. Even this can be avoided if a suitable Lights-out system is in place or remote boot is possible.

Note that the system BIOS should be set to boot from the prepared Windows PE boot ISO whether this is in the form of a physical CD/DVD or ISO image. It is also possible to network boot the PE image.

3.1 Boot Recovery Environment

Once the customised boot image is booted the normal plug and play sequence will run and then the automated DR will proceed if the DR answer file is found in one of the prescribed locations. If the file is not found the normal interactive GUI will be displayed.

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3.1.1 Answer File In CD/DVD Image

If the DR answer file is detected within the CD/DVD image then the automated DR will proceed with no User intervention. Each step in the disaster recovery process will be displayed on the system console and recorded to a log file. This log file will be transferred to the location specified in the DR answer file at the end of the recovery.

At the end of the DR sequence the logs will be copied to the location specified in the answer file. At this point the recovered system will be automatically booted if configured as such in the DR answer file. Otherwise manual intervention will be required to boot the system (by pressing the <ESC> key).

If errors are detected during the restore process the recovery will halt or re-boot the system depending upon the setting in the answer file.

Note that if the boot media is configured to boot directly into the PE boot environment after recovery, manual intervention will be required to reset the boot sequence on the system to prevent the PE boot environment being booted once more. Normally the system BIOS should be reset to boot from the OS disk as required.

3.1.2 Answer File On Removable Device

If the DR answer file is detected on any attached removable media then the automated DR will proceed with no User intervention. Each step in the disaster recovery process will be displayed on the system console and recorded to a log file. This log file will be transferred to the location specified in the DR answer file at the end of the recovery.

At the end of the DR sequence the logs will be copied to the location specified in the answer file. At this point the recovered system will be automatically booted if configured as such in the DR answer file. Otherwise manual intervention will be required to boot the system (by pressing the <ESC> key).

If errors are detected during the restore process the recovery will halt or re-boot the system depending upon the setting in the answer file.

Note that if the boot media is configured to boot directly into the PE boot environment after recovery, manual intervention will be required to reset the boot sequence on the system to prevent the PE boot environment being booted once more. Normally the system BIOS should be reset to boot from the OS disk as required.

3.2 Check Result Of Recovery

It is recommended that after the recovery has completed that the saved log files are inspected to ensure that the DR ran with no reported errors.

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